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ABSTRACT

This longitudinal study examined the education of language minority students in five school districts nationwide. Qualitative data included interviews, school visits, surveys, and source documents. Quantitative data included information from registration centers, language minority student databases, student information systems databases, testing databases, and other federal and state reporting databases. Overall, the districts have attempted to address the dimensions of the Prism Model of Language Acquisition for School (Thomas & Collier in Ovando & Collier, 1998) as they continue to improve programs for English language learners (ELLs). This model emphasizes four developmental processes that students experience through K-12 sociocultural, linguistic, cognitive, and academic processes. Findings demonstrate the importance of providing a socioculturally supportive school environment for language minority students that allows natural language, academic, and cognitive development to flourish in the native and second language. Findings note that each school context is different, and significant elements within each context can strongly influence students' academic achievement. Bilingually schooled students outperform monolingually schooled students in all subjects after 4-7 years of bilingual education. Short-term programs are not sufficient for ELLS with no English proficiency. The strongest predictor of L2 achievement is amount of formal L1 schooling. (Contains 24 references.) (SM)

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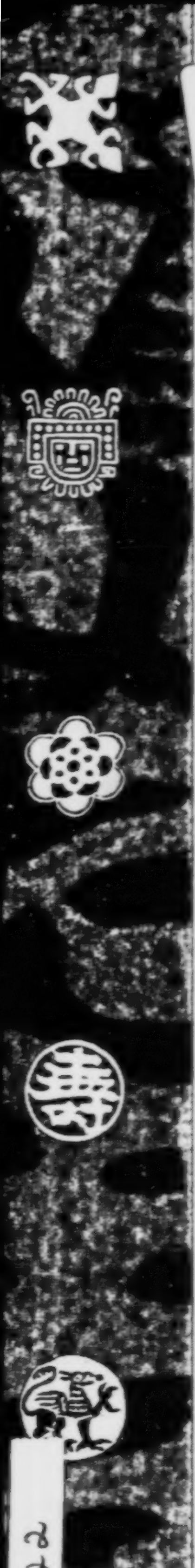

A NATIONAL STUDY OF SCHOOL EFFECTIVENESS FOR LANGUAGE MINORITY STUDENTS' LONG-TERM ACADEMIC ACHIEVEMENT

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A NATIONAL STUDY OF SCHOOL EFFECTIVENESS FOR LANGUAGE MINORITY STUDENTS' LONG-TERM ACADEMIC ACHIEVEMENT

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CENTER FOR RESEARCH ON EDUCATION, DIVERSITY & EXCELLENCE

2002

A National Study of School Effectiveness for Language Minority Students' Long-Term Academic Achievement

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A National Study of School Effectiveness for Language Minority Students' Long-Term Academic Achievement

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Executive Summary

Purpose. Our research from 1985 to 2001 has focused on analyzing the great variety of education services provided for language minority (LM) students in U.S. public schools and the resulting long-term academic achievement of these students. This five-year research study (1996-2001) is our most recent overview of the types of U.S. school programs provided for these linguistically and culturally diverse students, focusing on English language learners' (ELLs/LEPs) long-term academic achievement in Grades K-12. This study includes qualitative and quantitative research findings from five urban and rural research sites in the northeast, northwest, south-central, and southeast U.S. It is designed to answer urgent policy questions of interest to the federal and state governments of the United States, since this demographic group is projected to be 40 percent of the school-age population by the 2030s and most U.S. schools are currently under-educating this student group. Overall, this research provides whole school district views of policy decision-making that is data-driven regarding designing, implementing, evaluating, and reforming the education of LM students.

Analyses. As principal investigators, we established a collaborative research agreement with each school district that chose to participate, to follow every LM student who entered the school district for every year of his/her attendance in that school district, by each program type attended including the mainstream, and by cohorts of similar student background (e.g. socioeconomic status, primary language [L1] and second language [L2] proficiency upon entry, prior schooling). Measures of student achievement were those administered by the school district, including standardized test scores. We reported generalizations across school districts based on group performance on standardized measures, in normal curve equivalents (NCEs–equal-interval percentiles). Quantitative analyses proceeded through five research stages (presented in detail in report), each stage followed by collaborative interpretation of the results with school district staff. Qualitative analyses from interviews, school visits, surveys, and source documents, included historical demographic patterns of linguistically diverse groups of each U.S. region, the sociolinguistic and social context for the school programs, and specific implementation characteristics of each program type, including a case study of one school innovation.

Research sites, student samples, and program types analyzed. By written agreement, the school districts participating in each of our studies are promised anonymity until they choose to self-identify. For this study, four sites decided to self-identify–Madawaska School Department and School Administrative District #24, both located in northern Maine; Houston Independent School District in Texas; and Grant Community School in Salem, Oregon. The total number of student records collected in the five school districts featured in this report was 210,054. (One student record includes all the school district records for one student collected during one school year, such as student background characteristics, the grade level and school program(s) that student attended, and academic achievement measures administered to that student during the school year.) Over 80 primary languages were represented in the student samples, but the data analyses in three of the five research sites focused on Spanish speakers, the largest language group in the U.S. (75 percent of the U.S. LM school-age population). The student samples included newly arriving immigrants as well as ethnolinguistic groups of French cultural and linguistic roots in the northeast and students of Spanish-speaking heritage in the south-central U.S. The analyses focused on student outcomes from eight major different program types for LM students–90-10 two-way bilingual immersion (or dual language), 50-50 two-way bilingual immersion, 90-10 one-way developmental bilingual education, 50-50 one-way developmental bilingual education, 90-10 transitional bilingual education, 50-50 transitional bilingual education, English as a Second Language (ESL) taught through academic content, and the English mainstream.

FINDINGS: Qualitative findings are presented in the full report. Major findings from the quantitative analyses that are statistically and practically significant for decision-making are presented below. For decision-making purposes, a 4 NCE difference between groups is considered a small but significant difference (equivalent to 0.2 of a national standard deviation [s.d.]), 5 NCEs an actionable significant difference (0.25 of a national s.d.), 6 NCEs a moderate significant difference (0.3 of a national s.d.), and 10 NCEs a very large significant difference (0.5 of a national s.d.).

ENGLISH ACHIEVEMENT FINDINGS: Focusing first on **program comparisons**, we summarize **English language learners' long-term achievement** on nationally standardized tests (ITBS, CTBS, Stanford 9, Terra Nova) **in English Total Reading** (the subtest measuring academic problem-solving across the curriculum–math, science, social studies, literature), for students who entered the U.S. school district with little or no proficiency in English in Grades K-1, and following them to the highest grade level reached by the program to date:

- English language learners immersed in the English mainstream because their parents refused bilingual/ESL services showed large decreases in reading and math achievement by Grade 5, equivalent to almost 3/4 of a standard deviation (15 NCEs), when compared to students who received bilingual/ESL services. The largest number of dropouts came from this group, and those remaining finished 11th grade at the 25th NCE (12th percentile) on the standardized reading test. (pp. 113-114, 122-124, Figures C-1, C-2, Tables C-1, C-2, C-10, C-11)

- When ESL content classes were provided for 2-3 years and followed by immersion in the English mainstream, ELL graduates ranged from the 31st to the 40th NCE with a median of the 34th NCE (23rd percentile) by the end of their high school years. (pp. 112-114, 126-127, 241-256, Figures C-1, C-2, E-1, E-6, E-7, E-8, E-9, E-14, Tables C-1, C-2, E-1, E-6, E-7, E-8, E-9, E-14)

- 50-50 Transitional bilingual education students who were former ELLs, provided with 50 percent instruction in English and 50 percent instruction in Spanish for 3-4 years, followed by immersion in the English mainstream, reached the 47th NCE (45th percentile) by the end of 11th grade. (pp. 112-114, 126-127, Figures C-1, C-2, Tables C-1, C-2)

- 90-10 Transitional bilingual education students who were former ELLs reached the 40th NCE (32nd percentile) by the end of 5th grade. (In 90-10 TBE, for Grades PK-2, 90 percent of instruction is in the minority language, gradually increasing English instruction until by Grade 5, all instruction is in the English mainstream for the remainder of schooling.) (pp. 119-122, Figure C-8, Table C-7)

- 50-50 One-way developmental bilingual education students who were former ELLs reached the 62nd NCE (72nd percentile) after 4 years of bilingual schooling in two high-achieving school districts, outperforming their comparison ELL group schooled all in English by 15 NCEs (almost 3/4 of a national standard deviation–a very large significant difference). By 7th grade, these bilingually schooled former ELLs were still above grade level at the 56th NCE (61st percentile). (A one-way program is one language group being schooled through two languages.) (pp. 48-52, 58, Figures A-1, A-3, Tables A-5, A-6)

- 90-10 One-way developmental bilingual education students who were former ELLs reached the 41st NCE (34th percentile) by the end of 5th grade. (90-10 means that for Grades PK-2, 90 percent of instruction is in the minority language, gradually increasing English instruction to 50 percent by Grade 5, and a DBE program continues both languages in secondary school.) (pp. 119-122, Figure C-8, Table C-7)

- 50-50 Two-way bilingual immersion students who were former ELLs attending a high-poverty, high-mobility school: 58 percent met or exceeded Oregon state standards in English reading by the end of 3rd and 5th grades. (Two-way is two language groups receiving integrated schooling through their two languages; 50-50 is 50 percent instruction in English and 50 percent in the minority language.) (pp. 201-204, Figures D-1, D-6, Table D-18)

- 90-10 Two-way bilingual immersion students who were former ELLs performed above grade level in English in Grades 1-5, completing 5th grade at the 51st NCE (51st percentile), significantly outperforming their comparison groups in 90-10 transitional bilingual education and 90-10 developmental bilingual education. (pp. 119-121, Figure C-8, Table C-7)

SPANISH ACHIEVEMENT FINDINGS: A goal of one-way and two-way bilingual education is to graduate students who are fully academically proficient in both languages of instruction, to prepare these students for the workplace of the 21st century. We summarize **native-Spanish-speakers' long-term achievement** on nationally standardized tests (Aprenda 2, SABE) **in Spanish Total Reading** (the subtest measuring academic problem-solving across the curriculum–math, science, social studies, literature), following them to the highest grade level reached by the program to date:

- In 50-50 Two-way bilingual immersion, Spanish-speaking immigrants after 1-2 years of U.S. schooling achieved at a median of the 62nd NCE (71st percentile) in Grades 3-6. These immigrants arrived on or above grade level and maintained above grade level performance in Spanish in the succeeding two years. (pp. 199-200, Figure D-2, Tables D-5, D-6)

- In 90-10 Transitional bilingual education classes, native-Spanish speakers reached the 56th to 60th NCE (61st to 68th percentile) for Grades 1-4, and after moving into all-English instruction in Grade 5, they tested at the 51st NCE, still on grade level in Spanish reading achievement. (pp.117-119, Figure C-5, Table C-4)

- In 90-10 Developmental bilingual education classes, native-Spanish speakers reached the 56th to 63rd NCE (61st to 73rd percentile) for Grades 1-4, and in Grade 5 they outperformed the TBE comparison group by 4 NCEs at the 55th NCE (60th percentile). (pp. 117-119, Figure C-5, Table C-4)

- In 90-10 Two-way bilingual immersion classes, native-Spanish speakers reached the 58th to 65th NCE (64th to 76th percentile) for Grades 1-4, and in Grade 5 they outperformed the TBE and DBE comparison groups by a significant 6 NCEs at the 61st NCE (70th percentile). (pp. 117-119, Figure C-5, Table C-4)

- In reading achievement across the curriculum, native-Spanish speakers outperformed native-English speakers when tested in their native language, for Grades 1-8, regardless of the type of bilingual program Spanish-speaking students received. Native-Spanish speakers remained significantly above grade level at every grade except sixth grade (at the 49th NCE), reaching the 64th NCE (74th percentile) in 8th grade. (pp. 117-119, Figure C-3, Table C-3)

ACHIEVEMENT FINDINGS IN OTHER SUBJECTS:

- We chose the reading subtest of the standardized tests (results presented above) as the "ultimate" measure of attainment, because LM students' reading scores were consistently the lowest among the subjects, and this is the measure that most closely correlates with the standardized tests required for admission to post-secondary education. Generally, LM students achieved 5-10 NCEs higher in English language arts, math, science, social studies, and writing. (pp. 46-53, 111-114, 119-122, 241-256, Figures A-4, A-5, C-9, C-10, E-1 to E-14 and accompanying tables)

- In Spanish math, native-Spanish speakers generally outperformed native-English speakers tested in English math. When comparing native-Spanish speakers' achievement in Spanish math by program, for Grades 2-5, students attending all three bilingual program types achieved at or above the 55th NCE (60th percentile). But the Spanish speakers attending 90-10 Two-way bilingual immersion classes outperformed the Spanish speakers in 90-10 TBE and 90-10 DBE classes by 3-6 NCEs on Spanish math achievement, reaching the 59th NCE (66th percentile) by 5th grade. (pp. 114, 117-118, Figures C-4, C-6, Tables C-3, C-4)

ACHIEVEMENT OF NATIVE-ENGLISH SPEAKERS IN TWO-WAY BILINGUAL ED:

- Native-English speakers in two-way bilingual immersion programs maintained their English, added a second language to their knowledge base, and achieved well above the 50th percentile in all subject areas on norm-referenced tests in English. These bilingually schooled students equaled or outperformed their comparison groups being schooled monolingually, on all measures. (pp. 46-53, 119, 124, 201-204, Figures A-3 to A-5, D-1, D-3, D-5, D-7, D-9, Tables A-1 to A-11, C-4, C-12, C-13, D-1 to D-4, D-7, D-8, D-10, D-12, D-13, D-15, D-17 to D-10)

INFLUENCE OF STUDENT BACKGROUND ON STUDENT ACHIEVEMENT:

- Socioeconomic status (SES) typically influenced from 3-6% of LM students' reading achievement as measured by standardized tests, for both enrichment dual language programs and ESL content programs. In selected circumstances (e.g., oral proficiency of Spanish speakers learning English) the effect of SES explains as much as 11-12% of achievement. However, the effect of number of years of program participation on reading achievement varied with the program type. For one-way and two-way dual language programs, up to five years of program participation accounted for 6-9% of ELLs' reading achievement on standardized tests. For Spanish speakers learning English, 20% of oral proficiency was attributable to program exposure while program exposure accounted for 15% of oral proficiency for English speakers learning Spanish. In the case of the ESL Content program, years of schooling accounted for less than 2% of end-of-school reading achievement as measured by standardized tests. Thus, a strong dual language program can "reverse" the negative effects of SES more than a well-implemented ESL Content program by raising reading achievement to a greater degree. (pp. 56-57, 204-206, 256-258, Tables A-18, D-20, E-16 to E-18)

- The One-way developmental bilingual education program in Northern Maine influenced 8.5% of former ELLs' eventual reading achievement, exceeding the effects of low socioeconomic status at less than 4%. The Two-way bilingual immersion program at Grant Community School exerted a powerful and significant effect on Spanish-speaking students' scores on oral English development and influenced about 6 percent of their standardized reading scores as assessed in English, while SES accounted for about 4%. In this high-poverty school, SES alone accounted for 14 percent of the observed achievement variance overall. Thus, the school's dual language program is reducing the negative effects of SES by significant amounts for Spanish speakers learning English and taking the statewide assessment in English. (pp. 56-57, 204-206, 256-258, Tables A-18, D-20, E-16 to E-18)

- Number of years of primary language schooling, either in home country or in host country, had more influence than socioeconomic status when the number of years of schooling was 4 or more years. In addition, the L2 academic achievement of older immigrant arrivals with strong grade-level schooling completed in L1 in the home country was less influenced by low socioeconomic status and more dependent on number of years completed. Likewise, students of low socioeconomic status who were born in the U.S. or arrived at a very young age achieved at high levels in L2 when grade-level schooling was provided in both L1 and L2 in the U.S. (pp. 257-258, Figures C-1, E-6, E-7, Tables C-1, E-6, E-7, E-17, E-18)

- When immigrants were schooled all in English in the U.S., students who received 4-5 years of L1 schooling in home country (arriving at ages 10-12) scored 6 NCEs higher in English reading in 11th grade than those who received 1-3 years of home country schooling (arriving at ages 7-9). (pp. 248-251, Figures E-6, E-7, Tables E-6, E-7)

- Immigrants with interrupted schooling in home country achieved significantly below grade level, when provided instruction only in English. Those one year below grade level on arrival were at the 29th NCE (16th percentile) on the English reading test by 11th grade, those two years below grade level on arrival at the 26th NCE (13th percentile), those three years behind at the 20th NCE (8th percentile), and those four years behind at the 19th NCE (7th percentile). (pp. 251-253, Figure E-8, Table E-8)

- Gender differences among Hispanic students were found to be significant in only two subject areas–math and science. Hispanic males outperformed Hispanic females by 4 NCEs in math and 6 NCEs in science on the 11th grade tests in English. (p. 256, Figure E-14, Table E-14)

MAJOR POLICY IMPLICATIONS:

- Enrichment 90-10 and 50-50 one-way and two-way developmental bilingual education (DBE) programs (or dual language, bilingual immersion) are the only programs we have found to date that assist students to fully reach the 50th percentile in both L1 and L2 in all subjects and to maintain that level of high achievement, or reach even higher levels through the end of schooling. The fewest dropouts come from these programs.

- Parents who refuse bilingual/ESL services for their children should be informed that their children's long-term academic achievement will probably be much lower as a result, and they should be strongly counseled against refusing bilingual/ESL services when their child is eligible. The research findings of this study indicate that ESL or bilingual services, as required by *Lau v. Nichols*, raise students' achievement levels by significant amounts.

- When English language learners (ELLs) initially attend segregated, remedial programs, these students do not close the achievement gap after reclassification and placement in the English mainstream. Instead, they maintain or widen the gap in later years. Therefore, their average achievement NCE at reclassification should be as high as possible, since this is likely to be their highest achievement level that they reach during their school years. Ideally, instructional gains are best accomplished in an enrichment (not a remedial) program.

- Students with no proficiency in English must NOT be placed in short-term programs of only 1-3 years. In this study and all other research studies following ELLs long term, the minimum length of time it takes to reach grade-level performance in second language (L2) is 4 years. Furthermore, only ELLs with at least 4 years of primary language schooling reach grade-level performance in L2 in 4 years. As a group, students with no primary language schooling (either in home country or host country) are not able to reach grade-level performance in L2.

- The strongest predictor of L2 student achievement is amount of formal L1 schooling. The more L1 grade-level schooling, the higher L2 achievement.

- Bilingually schooled students outperform comparable monolingually schooled students in academic achievement in all subjects, after 4-7 years of dual language schooling.

- Students who receive at least 4-5 years of grade-level L1 schooling in home country before they emigrate to the U.S. typically reach the 34th NCE (23rd percentile) by 11th grade when schooled all in English in the U.S. in an ESL Content program, and then the mainstream. These students are on grade level when they arrive, but it takes them several years to acquire enough English to do grade-level work, which is equivalent to interrupting their schooling for 1 or 2 years. Then they have to make more gains than the average native-English speaker makes every year for several years in a row to eventually catch up to grade level, a very difficult task to accomplish within the remaining years of K-12 schooling.

- The highest quality ESL Content programs close about half of the total achievement gap.

- When ELLs initially exit into the English mainstream, those schooled all in English outperform those schooled bilingually when tested in English. But the bilingually schooled students reach the same levels of achievement as those schooled all in English by the middle school years, and during the high school years the bilingually schooled students outperform the monolingually schooled students (see Figure C-2).

- Students who receive at least 5-6 years of dual language schooling in the U.S. reach the 50th NCE/percentile in L2 by 5th or 6th grade and maintain that level of performance, because they have not lost any years of schooling. Students who are raised in a dual language environment need at least 4 years of schooling in L1 and 4 years of schooling in L2 to achieve on grade level in either of the two languages. Providing bilingual schooling in the U.S. meets both needs simultaneously, typically in 4-7 years, leading to high academic achievement in the long term.

- Bilingual/ESL Content programs must be effective (at least 3-4 NCE gains per year more than mainstream students are gaining per year), well implemented, not segregated, and sustained long enough (5-6 years) for the typical 25 NCE achievement gap between ELLs and native-English speakers to be closed. Even the most effective programs can only close half of the achievement gap in 2-3 years, the typical length of remedial ELL programs. Therefore, short-term, remedial, and ineffective programs cannot close the large achievement gap and should be avoided.

- An enrichment bilingual/ESL program must meet students' developmental needs: linguistic (L1-L2), academic, cognitive, emotional, social, physical. Schools need to create a natural learning environment in school, with lots of natural, rich oral and written language used by students and teachers (L1 and L2 used in separate instructional contexts, not using translation); meaningful, 'real world' problem-solving; all students working together; media-rich learning (video, computers, print); challenging thematic units that get and hold students' interest; and using students' bilingual-bicultural knowledge to bridge to new knowledge across the curriculum.

Purpose

Our research from 1985 to 2001 has been focused on analyzing the great variety of education services provided for language minority students in U.S. public schools and the resulting academic achievement of these students. We are the first researchers to analyze many long-term databases collected by school districts in all regions of the U.S., and we have collected the largest set of quantitative databases gathered for research in the field of language minority education. This current five-year research study (1996-2001) is our most recent overview of language minority students' long-term achievement, depending upon the type of program in which these students are placed.

It is urgent that federal and state governments know what school practices are most effective for language minority students, because this demographic group is fast becoming the largest "minority" group in U.S. schools. Students whose home language is other than English are projected by the U.S. Census Bureau to be 40 percent of the school-age population by the 2030s, and possibly sooner if present demographic trends continue. Our data analyses from 1985 to 2001 show that most U.S. schools are dramatically under-educating this student population. As a country, we cannot afford continuation of current practices, at the risk of under-preparing a large segment of our workforce for the 21st century. For this study, we are reporting on long-term data collected from five school districts, analyzing some of the most promising models for schooling language minority students, and the resulting student outcomes.

Overall, our findings of this study confirm our findings from the five large urban and suburban school districts in our analyses conducted from 1991 to 1996. In addition, we have enhanced generalizability of our findings by including in this study two rural school districts. All regions of the U.S. are represented in our series of studies from 1991 to 2001, thus providing a fairly comprehensive picture of the variety of services provided by U.S. public schools for language minority students throughout the country.

This is an ongoing study. Although we are reporting the results of the most complete longitudinal and cross-sectional databases that we have collected over the past five years, the school districts plan to continue working with us as collaborative research partners, so that the results of the research analyses will inform their practices. This study thus serves two major functions–providing the federal government with an overview of effective practices for language minority students, and answering questions for more effective, data-driven decision making among the participating school districts. Most of all, this study is designed to answer major policy questions of interest to the federal and state governments of the United States.

Research Design

Our research design is based on a comprehensive data collection effort at each research site, collecting both qualitative and quantitative data that directly address the policy questions of the school district, regarding language minority students and their academic achievement over the long term (4-12 years). We, as well as many other researchers in language minority education, have found that short term research, examining student outcomes for 1-2 years, presents an incomplete and inaccurate picture of language minority students' continuing academic success (Collier, 1992; Cummins, 2000; Lindholm-Leary, 2001; Ramirez, Yuen, Ramey & Pasta, 1991; Thomas & Collier, 1997). Thus the focus of our work is to examine the long-term outcomes in student achievement, following language minority students across as many years of their schooling as is possible within each school district.

We conduct this research at the school district level, collecting data from the central administrative offices, including the offices of testing, bilingual/ESL education, curriculum supervisors, and data processing. We also in each school district collect some school-level data, focusing on visits and interviews with staff and students of individual schools that stand out as promising models of school reform for language minority students, based on their student achievement data. Overall, however, this research could be characterized as providing whole school district views of policy decision-making that is data-driven regarding designing, implementing, evaluating, and reforming the education of language minority students.

In this process of data collection, the school district staff are collaborative researchers with us. Our initial contact is usually the central administrative assistant superintendent or curriculum supervisor in charge of bilingual/ESL services in the school district. Initial meetings include central administrative staff from the bilingual/ESL and research and evaluation offices of the school district, followed by meetings with the superintendent and associate/assistant superintendents. When all of these parties have agreed to a collaborative research plan, we begin collecting data in that school district. The following overview describes some of the initial processes that are discussed in these first meetings.

What We Do with Each School District as Collaborative Researchers: Initial Stages of Study

Prior to data collection and analysis, we work extensively with our participating school districts to enable them to engage more effectively with us in a multi-year collaborative relationship. In doing so, we introduce our "middle-out" strategy of school reform. Specifically, we:

- Foster a reform climate in each school district by providing professional presentations and consultations for school board members and other policy makers;
- Move the school district towards decision-making based on their own locally-collected data, rather than decision-making based mainly on opinion or political expediency;
- Enable critical staff (mid-level administrative bilingual and ESL staff) to facilitate the change process, through our "middle-out" approach to school reform (rather than top-down or bottom-up approaches);
- Educate and sensitize policy-making staff (central administrators, school board, principals, and resource staff) to pertinent concepts and concerns regarding the education of language minority students;
- Provide an inquiry framework with our general research questions, and encourage school district staff to add meaningful research questions of local interest;
- Introduce and utilize the methodology of program evaluation, based on large-scale studies, with focus on sustained, long-term effects and outcomes (4-12 years), not on the short term (1-2 years). This type of research addresses overall pragmatic concerns of policy makers, focusing on program outcomes at the school and district levels. Therefore, together we:

- Elicit and clarify local concerns and values;
- Conduct needs assessment;
- Practice formative program improvement and installation prior to summative analysis, to enable full and best implementation practices;
- Acknowledge that most educational effects are small in the short term and practically significant only in the cumulative long term;
- Work with our school district colleagues to decide together on the appropriate data to collect; we advise on data collection methodology and provide technical expertise on instrument development; they collect the data and retain ownership of the data; we analyze the data collected; and we and they collaboratively interpret the results of data findings. As collaborative researchers with us, the school district staff are our "eyes and ears," and they carry the primary burden of day-to-day data collection;
- Focus our research on large groups of students across program types and across the years, not on small groups studied intensively for a short time. We follow students initially placed in a special program as they continue in the mainstream in later years, to examine their long-term academic achievement across the years;
- Provide pragmatically useful information to policy-makers. At the beginning of our long-term collaboration with each of our participating school districts, we provide the local policy-makers with information on the long-term outcomes of their local curricular choices, based on data analyses from other school districts. In many cases, this is the first time that policy-makers have had such information to guide their decision-making. We elicit and help clarify local concerns and values and respond to these in our presentations, in our suggested data collection activities, and in our data analyses.

In summary, if the school district is already inclined towards reform, we try to foster that reform climate by providing well-focused questions that local educators and other interested parties should ask of their programs, based on the experiences of other school districts with whom we have worked during the past 10-15 years. We provide a framework for local inquiry about the effectiveness of local schools with our general research questions of interest nationwide, and assist local educators in filling in our national questions with local research questions of interest to them. As data collection stages begin, together we collect and analyze data on both national and local research questions. As analysis results become available, we present these to local policy-makers, in conjunction with our collaborators. We make recommendations for policy changes that will enhance the program, add new program alternatives, or replace old program alternatives.

General Research Questions for All School District Sites in Project 1.1

The following six research questions are broad questions of interest that we apply to each school district setting. As we conduct the analyses to answer these questions, each school district site serves as the location of an individual study, focused solely on that school district. In the findings sections of this report, we will present each study separately. Following the five sections discussing the findings and interpretation of each school district's study, we will then present general patterns that have emerged across the five sites, to cross-validate the findings in each individual school district, and compare these findings to our findings in five other school district sites from our research from 1991 to 1996 (Thomas & Collier, 1997). The following are the general research questions addressed in each site. The first three questions describe the data gathered in the initial stages of the research, and the second set of questions pertain to the data analyses conducted in the later stages.

Initial Stages: Identifying Students, Programs, and Student Outcomes:

- What are the characteristics of language-minority students upon entry to the school district in terms of primary language, country of origin, first and second language proficiency, amount of previous formal schooling, socioeconomic status as measured by free and reduced lunch, and other student background variables collected by the school district?

- What types of special programs have been provided in each school for English language learners upon entry, and what are the chief distinguishing characteristics of each program, going back in time as many years as the central office staff consider historically meaningful and for which valid data are available?
- What student outcomes are used as measures of academic success for language minority students, including former English language learners?

Later Stages of Data Analyses:

- After participating in the various special programs, how much time is required for former English language learners to reach educational parity with native-English speakers on the school district's measures of academic success across the curriculum, including nationally normed standardized tests?
- What are the most important student background variables and program implementation variables that affect the long-term school achievement of language-minority students?
- Are there sociocultural/sociolinguistic variables that appear to influence language minority student achievement that vary by school or by geographic region, as identified by school staff?

In addition to these general research questions, the central office bilingual/ESL resource staff and research and evaluation staff of each school district sometimes add specific research questions of local interest that are addressed in the data analyses. Overall, the above research questions focus on the social context of each school system, the characteristics of the language minority students that the school system serves, and the measurement of student outcomes over as many years as can be meaningfully collected, examined by curricular program type that the students are placed in.

School District Sites

An important principle of this research design is that we have examined what exists in current school systems in the U.S., without initially imposing any changes on school practices.

After results of the data analyses are presented to the school staff, we do make recommendations for program improvement and we discuss and negotiate these with school district staff. As a result, the policy makers in the school district may choose to implement reforms based on the findings and on our recommendations, but we do not control these matters as in a laboratory experiment.

Each school district participating in this study was promised anonymity, in order to allow them to engage in renewal and reform without undue external interference. Our letter of agreement, signed with each superintendent, states that our participating school districts may identify themselves at any time as well as authorize us to do so, but that, until they do so, we as researchers will report results from our collaborative research only in forms that will preserve their anonymity. In this report, three school districts and one school have decided to self-identify. One school district remains anonymous by their staff's choice.

Also, the participating school systems retain ownership of their data on students, programs, and student outcomes. The researchers have limited rights of access to the data for purposes of collaboratively working with each school district to help them organize, analyze, and interpret existing data collected by the school districts, for the purpose of action-oriented reform from within. However, since the districts own their own data, the researchers may not distribute the data to others. We also provide extensive assurances that we will preserve student anonymity and will not allow individually identifiable student information to be published.

School districts were chosen through nomination from state education agencies and self-nomination based on the following criteria that we used in our first letter of introduction:

To be eligible to participate in our research study, a school district should have the following:

- A district-wide commitment to constructive reform of instruction, backed up by administrative willingness to experiment and to commit resources to evaluation and data collection activities, a willingness to engage in collaborative research to investigate what happens to language minority (LM) students in school in the long term, and active administrative support for the research up to the assistant superintendent level at least;

- A willingness to engage in collaborative research that seeks answers to politically difficult questions, to engage in collaborative development of locally-focused research questions, to collaboratively interpret the research findings with the researchers, and to implement the recommendations that proceed from the collaborative research;
- A willingness to commit to a sustained change process in which the district actively investigates what happens to local LM students in the long term, applies research findings to local decision-making on the most effective program choices for LM students, and actively moves to implement more effective instructional approaches over the next 3-5 years by emphasizing staff development and by providing active support for building administrators' efforts to implement and improve effective programs for LM students;
- Available student-level data stored on magnetic media on recent LM and non-LM student test scores (preferably normal curve equivalents [NCEs] and/or scaled standard scores on norm-referenced tests, but also criterion-referenced tests and performance assessments). For example, data might be available from years 1997-2001 for high school grades 9-12, from 1994-97 for middle school grades 6-8, and from 1991-94 for elementary grades 3-5;
- Available student-level data on student participation in LM programs in the past (e.g., from 1988 to the present), typically from the central student information system and/or from the Bilingual/ESL office. Data should be either on magnetic media or the school district should be willing to enter it into a computer from paper-based records;
- The district should have local computer capabilities and computer staff sufficient to allow for timely and accurate downloading of existing computerized data from microcomputers or mainframe computers.

In addition, the following characteristics are desirable in participating school districts:

- The school district should offer a variety of services to LM students and should be experienced in implementing these services through ongoing staff development;

- The school district should serve a variety of LM populations; districts that serve indigenous ethnolinguistic groups or that provide additional geographic diversity (e.g., rural or under-represented regions) and generalizability are especially desirable;
- In general, mid-to-large size school districts are more desirable than small districts because of larger sample sizes and greater student diversity (but there are exceptions to this);
- The school district should be willing, if needed, to (1) collect additional data (e.g., teacher survey, parent survey, student survey) and (2) convert paper-based student records to computer-readable form as necessary to address local and national research questions.

Research sites chosen

After travel to 26 states to identify school district sites during the year prior to OERI funding and the first year of the grant, 16 sites in 11 states were chosen as best representing the qualifications listed above. Our ultimate goal was to have, by the end of this five-year study, enough longitudinal data from five school districts to report their findings. In order to have extensive well collected data, we knew from previous research experience that it is necessary to collect data from many more sites than required, because many factors influence longitudinal data collection, such as student mobility, change in assessment instruments used by the school district, changes in state policies, new data management systems installed that do not allow retrieval of historical records, and changes in school management that bring about unexpected program changes.

The final five research sites presented in this report were able to make sustained efforts to maintain their programs and data collection systems for the full five years of this study. Their programs were the most consistent and cohesive, and the data management personnel were able to provide the most systematically collected data, and the reform orientation of the school system was maintained throughout the study. Also these five sites represent a purposive sample of some of the major regional contexts of the U.S., demonstrating greatly varied geographical and sociological contexts for schooling language minority students. We are grateful to the four sites (three school districts and one school) that have chosen to self-identify, since that allows for the richest social description of the context in which the students are schooled. The remaining school district is presented in more general terms, to preserve anonymity.

Varied locations of research sites. Regions represented are the northwest, northeast, southeast, and south central U.S. These school sites include two rural school districts in the northeast U.S. on the Canadian border (presented as one study, because of their proximity to each other and their similarity in school population served and programs provided), one inner city school in an urban school district in the northwest, one very large urban school district in the south central U.S., and one middle-sized urban school district in the southeast.

Linguistic and cultural groups represented. The primary languages of the students represented in the databases for this study include over 70 languages, but our data analyses in three of the five studies focus on the academic achievement of native Spanish speakers, the largest language minority group in the United States (75 percent of the language minority school-age population). Two of our studies examine the academic achievement of newly arriving immigrants. Two other studies focus on students from ethnolinguistic groups with cultural and linguistic heritages that predate the beginning of the United States–students of French cultural and linguistic roots in the northeast and students of Spanish-speaking heritage in the southwest U.S. The fifth study includes both new immigrants and U.S.-born Hispanic students.

Overall, the data analyses of this research focus on English language learners who begin their schooling with no proficiency in English, but since ELLs do not remain ELLs forever, we refer to them as language minority students (or former ELLs or ESL/bilingual graduates), because as we follow them across the grades K-12, they make progress in acquiring the English language and they are eventually reclassified as English-proficient. Since all our analyses our long-term, our findings represent former ELLs who are at various stages of proficiency development in English and their primary language, and are gradually reaching grade-level achievement in English.

Program types represented. These school districts have well collected data on eight major different program types for English language learners. Each school district provides a different combination of programs. Overall, these school districts provide a very rich picture of variations in schooling for English language learners. The analyses include student outcomes from 90-10 two-way bilingual immersion (or dual language), 50-50 two-way bilingual immersion, 90-10 one-way developmental bilingual education, 50-50 one-way developmental bilingual education, 90-10 transitional bilingual education, 50-50 transitional bilingual education, English as a Second Language (ESL) taught through academic content, and the English mainstream. In this report, we present data analyses that cover student achievement on standardized tests in English and Spanish (when available) for Grades K-5 in three districts and grades K-11 in two districts.

Student records sample. The total number of student records collected in the five districts featured in this report is 210,054. One student record includes all the school district records for one student collected during one school year, such as that student's background characteristics (which might include socioeconomic status as measured by free and reduced lunch, level of English proficiency and primary language proficiency upon entry to the school district, and amount of prior formal schooling), the grade level and school program(s) that student attended, and academic achievement measures administered to that student during the school year. Each school district is different in what data they collect and we found it necessary to customize our generic plan to meet the specific needs and characteristics of each school system.

Data Collection

Collecting qualitative data. Qualitative data for this study come from many different sources. To describe the social context for each language group being schooled in a given school system, we collected source documents that include reports and studies conducted by the research and evaluation office and the bilingual/ESL office, program manuals, district-wide reports on student and school demographics, newspaper articles, books that describe the region, professional journal articles, and state legislative policy documents that have an impact on language minority education. We kept detailed records of our interviews with central office administrators, school board members, administrators of the bilingual/ESL programs, principals, teachers, and community members. With each visit to the school district, we collected source documents and conducted interviews with central administrative staff and the bilingual/ESL administrators and resource staff, to analyze current policies and practices.

These source documents and interviews provided important information for analyzing the regional context for educating the language minority groups who attend the schools. Each of the studies for which we have been given permission to identify the school district begins with a section that analyzes some of the historical demographic patterns of culturally and linguistically diverse groups that have settled in that region, followed by a specific focus on the state and then the local context for schooling these diverse groups. Included are some analyses presented from political, economic, historical, sociological, anthropological, and linguistic perspectives.

We also visited some schools and individual classrooms on each visit, to clarify issues in classroom implementation, but our collaborative researchers–the bilingual/ESL resource staff–were our main source for collecting data on and analyzing general patterns in teachers' practices. For the smaller school districts where a survey was feasible to use, we collected data from each bilingual/ESL teacher, on a survey instrument that we developed for this study that was designed to categorize their general teaching practices, their teacher certification credentials, and general practices within their school building regarding the languages represented among the student population. This data collection instrument is provided in the appendices of this report. The surveys were administered and verified as accurate by the bilingual/ESL resource staff who regularly visit the teachers' classrooms and provide staff development assistance as needed

Collecting quantitative data. The following overview outlines some of the important sources for data that we collected from each school system that is stored on magnetic media in machine-readable files, and the process that we went through to prepare this data for the analyses. First, we assisted each school district to identify and gather their existing data from the many sources available in the district: e.g. Registration centers, Language minority/Title VII student databases, Student information system databases, Testing databases, and any other databases collected for state and federal reporting. To start this process, we provided a list of potential variables that could be included in the study, and the bilingual/ESL and research staff of the school district then met with us to jointly determine which variables were important to collect and available in machine-readable form. In some cases, existing databases had to be supplemented with new data, in order to answer research questions of local concern. Second, we assembled all data records from all sources and linked them by student ID to create year-by-year databases. Third, using relational database software, we compiled multi-year databases from the annual databases, creating an internally consistent data structure across the years.

As each data set arrived, we organized and restructured and cleaned the data to identify any problems in the data sets, in preparation for the initial exploratory, descriptive, and cross-sectional analyses. We also converted each data file from its initial format (FileMaker, dBASE4, Microsoft Access, Microsoft Excel, or fixed-length ASCII records) into the .DBF format of Visual FoxPro, the database package and programming language that we use. The data cleaning and data restructuring stages required much time and effort for several reasons. First, historical data were being collected from each school district, for as many years back as each school district had quality data available, and new data was being collected with each school year, resulting in a large number of annual data sets from each district. Second, since we helped school districts to collect and merge all of their data sources, which were often housed in separate offices, this stage represented a lengthy and complex process of reformatting, merging, and restructuring the data files to achieve compatible data structures and data coding protocols among the various data files originally created by different offices to meet a variety of different needs. We arrived at data structures and coding schemes that allowed us to address and answer each different research question, involving different units of analysis and analytical requirements.

Data Analyses

Once the data sets were restructured for compatibility with the requirements of our research questions, our research analyses proceeded through five stages. Initially, we performed descriptive summaries of each variable, including exploratory data plots and measures of central tendency and variability for each variable studied. After we conferred with the school district staff on any missing data and determined that complete data sets were present for each variable needed to answer the research questions, we used relational database computer programs to create cross-sectional databases that allowed examination of student performance and characteristics at one point in time. Then, we used these cross-sectional databases to create longitudinal databases that followed participating English language learners across the years of their school experiences. We began with longitudinal databases that followed students for at least four years, and then supplemented these with databases of students followed for five years, six years, and so on, up to 12 years, when available. Only students who attended at least 100 days of one school year were included in the analyses.

After analyzing these longitudinal databases separately, we then aggregated them so that all students in a given grade were combined across the years of available data in succeeding waves of students. For example, all those who persisted in the school district for five years (K-4) and who arrived at Grade 4 during either 1989, 1990, 1991, 1992, or 1993 were combined to examine fourth grade performance of all of these five-year cohorts over the past five-year period. Thus, the students who were in Grades K-4 during 1984-89, were combined with the K-4 students from 1985-90, with K-4 students from 1986-91, and so on up to the current school year. Collectively, these K-4 cohorts formed a "super-cohort" of K-4 students, combined from the current school year back in time for as many years as data were available.

The same analyses were then carried out for the six-year aggregate of fifth graders with six years of schooling. Similar analyses were conducted for each of the remaining school grades. This "layered cohort" approach allowed for full examination of the impact of programs for English language learners (ELLs) on student achievement for the past several years, and allowed for much greater sample sizes to be achieved than are possible in normal longitudinal analyses. Only longitudinal cohorts from the same grade range were combined. We made no use of linked or matched groups containing different students across time. Each cohort consisted of one group of students, followed for as long as they attended school in the district and each "super-cohort" group was analyzed separately. (See figure below.)

GRADE	**K**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
all 5 year cohorts	▨	▨	▨	▨	▨								
all 6 year cohorts	▨	▨	▨	▨	▨	▨							
all 7 year cohorts	▨	▨	▨	▨	▨	▨	▨						
all 8 year cohorts	▨	▨	▨	▨	▨	▨	▨	▨					
all 9 year cohorts	▨	▨	▨	▨	▨	▨	▨	▨	▨				
all 10 year cohorts	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨			
all 11 year cohorts	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨		
all 12 year cohorts	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	
all 13 year cohorts	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨

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The Five Stages of Analysis and the Research Questions for Each Stage

Our collaborative work with our participating school districts proceeds through five major stages over a period of 3-5 years. These stages, and their intents, evaluative questions, and required data are summarized and discussed in the following pages. This five-stage process initially examines the effects of past programs for English language learners (ELLs), and conducts a needs assessment to determine the size of the achievement gap between ELLs and the native-English-speaking students of the school district. During the initial stages, we work with the local school staff to train teachers in improved implementation of the programs, and help the district set up computerized systems to collect program evaluative data, and we allow the programs to mature to the point that they can be feasibly and validly evaluated.

These five stages provide a template for our research in each school district. As such, the stages generally guide but do not determine our work with the participating school districts. As circumstances and preferences differ among districts and among decision makers within districts, we modify and customize our procedures with each district to better address its characteristics and needs. However, we continue to address the overall concerns of each stage to the greatest degree possible. This flexibility avoids the "one-size-fits-all" problem in which a research study may sacrifice ecological validity in the interest of achieving a "standard" research design. On the other hand, we adhere to the same general evaluation questions, guidelines for program development, and types of measurement for each district in order to achieve an acceptable level of comparability among our participating districts. These five stages also reflect the program evaluation perspective that appropriate educational inquiry should focus initially on program development, on improving program processes, and on identifying and facilitating theoretically-based factors that should enable eventual program success in eliminating the achievement gap between native-English speakers and English language learners.

Stages 1 and 2 serve to describe and document the context, characteristics, and degree of the achievement gap. Specifically, Stage 1 work documents the achievement gap and brings it to the attention of school district decision makers for a decision as to whether the observed gap will be addressed or ignored. Stage 2, in turn, focuses on the district's English language learners and examines the degree to which they have closed the achievement gap while participating in an ELL program and after they have entered the mainstream curriculum, as broken down by years of program exposure and initial age of students when entering the ELL programs. Stage 3 examines how the achievement gap has developed over time and how it differs among the various ELL programs operated by a school district. It also provides decision-makers with trend data on student achievement by program type that guides further decisions affecting continued program development and improvement. Stage 4 provides a comparison and cross-validation of samples and cohorts in order to improve the generalizability of findings by not limiting the research to only one group of students followed across time. Finally, after the programs have been developed for several years and allowed to "mature" in terms of their ability to provide the most complete services to ELLs that each program can produce in that school district, Stage 5 addresses the summative questions of relative long-term program effectiveness and the factors that influence it.

Overview of Stage 1 Evaluation Work

Stage	Major Intent(s)	Primary Evaluative Questions	Data Needed
One	**A needs assessment** To document the district's past achievement outcomes for three mutually exclusive groups of students and to compare the five-year progress of the three groups (i.e., to conduct the Thomas-Collier Test of Equal Educational Opportunity): Group 1: former LEPs (English language learners) Group 2: students who are Language Minority (LM) but never classified as LEP (did not participate in a local LEP program) Group 3: native-English speakers who are not part of groups (1) or (2) above	After five years of appropriate instruction in the district, is there an achievement gap between former LEPs (English language learners) and native-English speakers? Has the achievement gap between former LEPs, LM-but-not-LEPs, and native-English speakers widened, narrowed, or remained the same for the past 5 years? Have groups of special interest (e.g., refusers of ESL services, waivered students) widened, narrowed, or maintained their achievement gap in the past 5 years?	downloads of test scores and student classification information from prior years Specifically: (1) student ID (2) original student classification (3) date entered school and LEP/ELL program (4) test scores from recent years (5) initial proficiency in English

Stage 1: A focused needs assessment. In Stage 1 analyses, we examine the difference in long-term achievement levels between three mutually exclusive groups: former English language learners (ELLs) who have received local ELL program services, language-minority students who were not classified as ELLs and were not in programs specially designed for ELLs, and non-language-minority native-English speakers. Naming this comparison the Thomas-Collier Test of Equal Educational Opportunity, we have required each of our participating school districts to examine this comparison as a condition of working with us. The Thomas-Collier Test establishes whether a school district's programs for ELLs are allowing ELLs to reach long-term achievement parity with non-ELLs in the district. It also forces districts to disaggregate the test scores for two frequently combined categories of language minority students–those who have been classified as

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LEP/ELL and are eligible for services, and those who are not. We have noted in the past that many school districts have "hidden" (intentionally or unintentionally) their English language learners' large achievement gap by reporting together the achievement of ELLs and non-ELLs who are members of language-minority groups. Districts have also focused only on the short-term achievement of these groups, ignoring the fact that achievement gaps continue to develop over time. Stage 1 analyses address this issue by comparing the achievement of language-minority LEP/ELLs served by local programs, language-minority non-LEP/ELLs not served by local programs, and non-language minority native-English speakers. In this way, a clearer and more accurate picture of the impact of local programs on English language learners' achievement emerges. Using the results of these analyses, the district can decide not to address these issues and drop out of our collaborative agreement, or decide to address these issues by continuing on to the successive stages of our joint research. Thus far, no school district has chosen to ignore the findings of Stage 1 analyses and drop out of our collaborative evaluation work.

Overview of Stage 2 Evaluation Work

Stage	Major Intent	Primary Research Questions	Data Needed
Two	A focus on assessing the achievement of LEP students to document the past and present achievement performance of LEP students (current and former English Language Learners who are in Group 1 from Stage One)	Do current LEP students close the achievement gap with each passing year in the LEP/ELL program? Do former LEP students close the achievement gap while in the regular curriculum? Do older LEP students close the achievement gap differently from younger students?	Additional student information needed: (1) date of birth (2) days attended school each year (3) date of exit from LEP/ELL program

Stage 2: ELLs' academic achievement gains by length of residence in the U.S. and age on arrival. In Stage 2 analyses, we focus on ELLs only and examine their achievement gains over the past 3-5 years. We break down their achievement gains by the students' length of residency in the U.S. (in the case of immigrants) or number of years of exposure to English. In addition, we break down achievement gains by student age upon entry into LEP/ELL programs or, for immigrants, by their age on arrival. We have found in prior research that ELLs' abilities to close the achievement gap differ greatly depending on whether they are participating in a LEP/ELL program or have left the ELL program and entered the regular instructional program. Since these prior findings imply that length of ELL program, as well as program quality, are both important factors in closing the large achievement gap, we devote Stage 2 to a thorough investigation of these matters. Thus, these analyses serve to confirm the findings of Stage 1 and to further explore how the observed achievement gap has developed in the school district. Neither Stage 1 nor Stage 2 examines the particular programs that ELLs received, but Stage 3 does.

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Overview of Stage 3 Evaluation Work

Stage	Major Intent	Primary Research Questions	Data Needed
Three	**A focus on program"productivity"** to determine the average annual long-term achievement pre-post gains of former LEP students who participated in various types of programs for LEP students	Which programs allow students to close the achievement gap over time and which do not? Do students in some programs close the achievement gap better or faster than in other programs? For each LEP/ELL program, what is the average sustained achievement gain per year for the past five or more years? How do gap closure rates compare for elementary, middle school, and high school years?	Student program participation data Specifically: (1) program type(s) student received each year

Stage 3: Achievement gap closure by program type. In Stage 3 analyses, we examine the degree of achievement gap closure that characterizes each program type that has been offered for ELLs by the school district during the past five years or more. Each program is described by its average rate of gap closure or achievement gain (e.g., 3.7 NCEs per year over a 10 year period) but no attempt is made to control for extraneous variables at this point because only average achievement gain per year is being examined. The research question of interest here is "looking at trend data in a time-series fashion, what has been the average progress of students in each program type, measured as average gain (and degree of achievement gap closure) over the past 3-5 years? Programs in which ELLs have closed the achievement gap are deemed more effective than programs with little or no demonstrated gap closure, independent of the characteristics of participating students or their initial scores at the beginning of the LEP program.

Stage 3 analyses serve several very important functions. First, they provide school district decision-makers with interim, formative information on student achievement that allows a

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"time-series" comparison of the effectiveness of their various program offerings for ELLs over the past several years. This is a pragmatic response to the political needs of school boards, superintendents, and program administrators to have in-progress interim results from their efforts to design better programs for English language learners. These groups are simply unable and unwilling to wait for years to know whether their efforts to improve ELL education are productive or not.

Second, stage 3 analyses provide useful information to the districts as to which of their past ELL programs have demonstrably closed the achievement gap and which have not. This information can be very enlightening to both administrators and teachers who may be personally convinced of the efficacy of one program type or another, but have never actually examined how student 'graduates' of their preferred program really perform in long-term school achievement, as measured by the same tests given to native-English speakers, on-grade-level and in English. The realization that their 'favorite' program (whether a type of English-only or English-plus instruction) is not really meeting the needs of their English language learners can serve as a refreshing "reality-check" and as a professional impetus to examine their professional assumptions and change their practices to reflect the characteristics of more demonstrably effective programs. On the other hand, if staff find that their 'favorite' program is somewhat effective for ELLs, but can be improved, this serves as an impetus for them to examine their practices as well, looking for new program strategies and processes that will allow them to improve an already-good program.

Such information is made more useful when conclusions and findings can be confirmed across multiple groups and contexts. Stage 4 addresses these issues of generalizability.

Overview of Stage 4 Evaluation Work

Stage	Major Intent	Primary Research Questions	Data Needed
Four	**Enhancing external validity (generalizability) and robustness of findings and conclusions** Revisit Stages One through Three by: (1) adding successive waves of longitudinal cohorts; (2) using cross-validation strategies to compare findings across groups; (3) employing resampling strategies.	Are the observed between-group and between-program differences in student achievement trends stable and consistent across comparable but different longitudinal cohorts of students during the past 5-10 years? For each program, what are the estimated means and standard deviations of the sampling distribution of findings across comparable grade-groups and cohorts for each program?	Stage 1-3 data for additional student cohorts and additional cross-validation groups

Stage 4: Increasing sample size by adding more cohorts and re-sampling techniques. In Stage 4, we add as many years of student data and as many longitudinal cohorts of the same students followed over time as are available and reasonable to add, to further increase sample sizes. This addresses the problem of student attrition caused by students leaving the school district, and thus the school districts' programs for English language learners. In addition, adding more student cohorts and groups provides opportunities for "mini-replication" of findings from initially-investigated student groups. In principle, this is similar to replicating an initial study, in that a separate but comparable student group is investigated, and findings are compared to those from the initial study. This form of 'robust' analysis can add much generalizability to the findings and conclusions of the initial study. In addition, this offers the opportunity to investigate separately any groups whose findings differ significantly from those of similar groups, looking for possible moderator variables or 'hidden' variables whose effects on local student achievement had not been previously recognized.

Also, in some instances of Stage 4 work , we use re-sampling techniques (e.g., the bootstrap), a set of statistical methods that yield valid population parameter estimates from local sample statistics to achieve more generalizable estimates of the long-term impact of special programs for ELLs on the English language learners in the school district. Since one of the ultimate objectives of our research and program evaluation efforts is to arrive at useful and valid estimates of the long-term achievement effects of various programs and program strategies for ELLs, re-sampling techniques provide additional insight into what the theoretical "national distribution" of long-term achievement scores would look like for students who had experienced each type of ELL program.

Only after the work of Stages 1-4 has been completed is it appropriate to take up questions of summative long-term program effectiveness in Stage 5. This is the case because it typically takes years to achieve a condition of (1) full development of the 'school district version' of each program to its design specifications; (2) full training of the professional staff to understand each program's instructional features and to deliver these features, and the program, as designed; (3) development of an adequate data-collection system in the school district that will allow on-going analyses of instructionally important variables and student characteristics over time, and not be limited to the typical 1-2 year data collection time frames in which most school districts operate.

Overview of Stage 5 Evaluation Work

Stage	Major Intent	Primary Research Questions	Data Needed
Five	**A quasi-experimental focus on LEP achievement by programs with appropriate, best-available control of extraneous variables** to determine the long-term achievement of LEP students who received selected LEP programs in the past with control of pertinent extraneous variables on the enhanced data sets from Stage Four	With selected extraneous variables controlled using sample selection, blocking, or ANCOVA (if appropriate), are there long-term differences in student achievement among programs?	Student characteristics and other variables to be controlled Specifically: (1) initial grade placement in school (2) free-reduced lunch for each year (3) initial achievement test scores at beginning of schooling in primary language and in English (4) initial proficiency in first language (5) other available student variables from surveys or from district's student information system

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Stage 5: Repeated-measures ANOVA, Multiple regression analyses and controlling for extraneous variables. Finally, in Stage 5 of our analyses, we turn to the research question, "Which program is better, when extraneous variables (e.g., initial differences between groups) are controlled?" These analyses are appropriate only after two conditions have been met. First, the programs for English language learners must have "matured" past the point of initial program installation and past the point of resolving "startup bugs." Second, the programs must have reached a point of full implementation by the school district that is faithful to the specifications and theoretical design features of each of the programs. Otherwise, level and quality of implementation is confounded with program type, resulting in the comparison of poorly implemented programs of one type with well implemented programs of another type. In order to arrive at valid between-program comparisons, all programs must be meeting their full theoretical potential in terms of implementation, at least to the point that is pragmatically possible within the context of good administrative support and well-trained teachers.

In stage 3, we collect information on program processes as well as on degree and quality of program implementation in each school. We accomplish this by means of surveys directed to each classroom teacher, by interviews with instructional coordinators who observe instruction in the schools for each program, and analyzing any data collected by the school district on how instruction is carried out in each school. These data are added to the data collection system and provide possible variables for use in Stage 5.

Quasi-experimental pitfalls

There are many problems with analyses in Stage 5 when attempting to control for extraneous variables. First, random assignment is almost always not available as a strategy for addressing potential differential selection problems. True random assignment, rather than systematic assignment of students from class lists to programs under the label of 'random assignment' is very rarely encountered for very good pragmatic and political reasons. Although some apparently naive researchers have called for randomized studies of ELL program alternatives, school administrators understand the large political difference between randomly assigning students to controversial, politically-sensitive treatment alternatives (e.g., English-only vs. bilingual programs) and assigning them to not-so-controversial alternatives such as slightly smaller vs. slightly larger classes that were studied in the recent Tennessee STAR evaluation of class size. In the former case, randomly assigning large numbers of students in a school district to program types strongly opposed by the students' parents, a necessary outcome of wide-scale use of random assignment, would amount to political suicide for the responsible school administrators. In the latter case, it was possible to conduct a randomized study in Tennessee because the treatment alternatives were not controversial and because the study was mandated by the state legislature. Thus, those who advocate such large-scale use of random assignment to study ELL programs are, in effect, announcing that they don't really understand the political difference between controversial and not-so-controversial program treatments, and also that they have no actual experience in conducting large-scale data collection and analyses in school districts. It is also worth noting that the most strident advocates of random assignment as a form of "scientific" research on ELL programs may also be those who are interested in reducing funding for such research by imposing funding conditions that are virtually impossible to meet in the typical school district.

Second, even in the rare cases when random assignment of students to different program alternatives is possible (e.g., it is illegal in the U.S. to randomly assign limited-English-proficient [LEP] students to no program treatment, so true "no-treatment" control groups are very difficult to arrange), we have observed that its effects in initially equated groups begin to deteriorate rapidly in a program that lasts more than about 2-3 years. This increasing group inequality over extended time periods is caused by the fact that students don't leave school for random reasons, either between programs or within programs, even when they have been randomly assigned to groups initially. This is especially true if the groups are of typical classroom size (15-30 students per group) because random assignment is a large group strategy and can often yield quite unequal groups when employed with small samples.

The interested researcher may verify this by taking a large sample of student records, randomly assigning the students to two arbitrary groups, and then comparing the groups on a fixed variable both initially and then again 4-5 years later, after substantial attrition has taken place in both groups. In many cases, the initially equated groups (e.g., average ages are the same in each group) are no longer equated after several years (i.e., average ages are significantly different in the two groups), because of differential student attrition in the two groups from non-random causes. Thus, we have found that random assignment works consistently only in short-term studies. However, in the short term of 1-2 years, small annual and cumulative effect sizes may not be detectable by statistical significance tests of appropriate power, until they reach values equivalent to .20-.30 standard deviations. Since most programs for ELLs have small annual effect sizes, this requires at least five years, thus making long-term studies mandatory.

A third problem is that the "scientific" use of analysis of covariance (ANCOVA) to 'equate' unequal groups after the fact is fraught with problems associated with violation of its necessary assumptions of linear relationship between covariate and dependent variable and between covariates, reliability of covariates, and homogeneity of regression, in addition to the usual ANOVA assumptions of normality and homogeneity of variance. The homogeneity of regression assumption must be tested explicitly for each ANCOVA or one runs the grave risk of either over-adjusting or under-adjusting the group means. If either of these happens, one has essentially removed real differences between groups or created artificial differences between groups. Either way, the legitimate comparison of 'comparable' students in different programs is quite invalidated from that point on. For all of these reasons, the use of true random assignment in evaluation of programs for English language learners is virtually impossible, despite naive calls for this by some researchers and politicians.

Therefore, in our stage 5 work, instead of random assignment, we use ANCOVA when its assumptions are met, and blocking in other circumstances. One can use blocking to create new independent variables (that might have been used as covariates) that are crossed with the independent variable of interest, Program Type. In this way, variation due to the potential covariate is removed and assessed separately as another independent variable and the effect of Program Type is analyzed as in a typical ANOVA. A significant interaction between Program Type and blocked independent variable indicates that the homogeneity of regression assumption would have been violated in an analysis of covariance, thus invalidating it. In addition, blocking is advantageous because it does not require the satisfaction of ANCOVA-type assumptions, and its power approaches that of ANCOVA when there are three or more groups defined in the blocked variable. In many cases, simply analyzing separately the groups defined by a blocked variable (e.g., separate longitudinal analysis of student achievement gains by program type for students of low, mid, and high socioeconomic status [SES]) achieves results that are quite useful for decision-making, without directly adjusting, often inappropriately, the dependent variable for the covariate SES, as in ANCOVA. If a consistent pattern of findings emerges (e.g., low SES students always score higher when in a two-way developmental bilingual program than do comparably low SES students in ESL Pullout programs), the researcher's confidence in the validity of the findings is bolstered to the point of utility in decision-making, without the use of random assignment, ANCOVA, or other pragmatically non-useful strategies.

Collaborative Interpretation of Data Analyses

When the data analyses from Stages 1-5 are completed, we return to the school districts for collaborative interpretation of the results with the bilingual/ESL central office staff and research and evaluation staff. Sometimes this leads to the decision to collect additional data, or to reanalyze the data, focusing on new or revised research questions of local interest. The process is cyclical and ongoing, and leads to changes in school policies and programs, collaboratively agreed upon by all decision makers in the school district. If the school districts wish to continue in this cyclical reform process by continuing to grant us access to their student data and test scores, we are presented with the opportunity to continue to engage with them in a "recyling" to earlier stages of our five-stage research process, and continued collaboration in their ELL program renewal efforts.

Findings from Two Rural Research Sites in the Northeast U.S.

The Regional Social Context

Two school districts that participated in our study–Madawaska School Department and School Administrative District #24–are located in northern Maine, along the U.S. border with Canada, in the St. John Valley. Each small town and the surrounding area that these school districts serve has a total population of 4-5,000 people. Student mobility in the schools is relatively low, since most remain in the community until graduation from high school. Over 90 percent of the students of these rural school districts are of Franco-American/Acadian heritage. While U.S. Census data indicate that French is the mother tongue of 97 percent of the residents of the towns served by these two school districts, French has actually been in strong decline in this region over the past half-century. The "power and status" language is English. An ambivalent view of bilingualism that developed during the 20th century among community members, parents, school personnel, and students, gradually led to a negative self-image among adult members of the francophone community, accompanied by lower school achievement of francophone students.

Cummins (2000, pp. 41-42) discusses the situation of minority francophone students in Canada, which parallels the experience of francophone students on the U.S. side of the border. Sociological analyses indicate that these francophone communities experience life in ways similar to subordinate minorities in other parts of the world. Power and identity issues come to the fore in institutions such as school, where the process of integration and assimilation creates a slow destruction of ethnolinguistic identity. Marginalized groups often experience ambivalence and insecurity in relation to their bilingual/bicultural identity, resulting in low achievement in school and underemployment in the workplace. Devaluation of the particular variety of the French language spoken in the border region further creates ambivalence, resulting in francophones' hostility toward the majority language group, shame for their own culture, and poor academic self-perception and performance.

Before the school innovation that we analyzed for our study was introduced in the two school districts of this border region, the francophone students were experiencing a high degree of subtractive bilingualism, with students gradually losing their oral French as they acquired oral and written English. Losing one's first language (L1) as second language (L2) is acquired generally leads to lower achievement in school; whereas additive bilingualism–acquiring L2 at no cost to L1–generally leads to high achievement in school (Lambert, 1975). Despite the francophone origins of the students, very few students used the French language to any significant degree in the home or community, due to the high level of linguistic assimilation within the community because past generations did not have the opportunity to be schooled in French (Landry & Allard, 1992). In fact, the previous generation, parents of the current students, were punished for speaking French in school. A school board member explained, "We've been brought up for a long time to see French as a street language, not worthy to be taught. We never learned to read it and write it ... It was not important enough to have in school" (Hoose, 1996).

Given this sociocultural context, the two school districts participating in this study chose to try to reverse the patterns of lower academic achievement among some of the francophone students, when compared to the achievement levels of anglophone and other bilingual francophone students in the same schools. To accomplish this goal, they developed an enrichment bilingual program for all students who chose to participate in the French-English classes, beginning with Grades K-2, expanding it to the upper primary grades, and eventually to middle school and high school levels. We were able to collect longitudinal data on students receiving bilingual schooling in Grades K-7 during the five years of this study, since the new program was implemented at more than one grade level with each successive year of program implementation.

This enrichment bilingual program was labeled a two-way model by the program implementers.

However, while the classes in these school districts include a few anglophone students, the large majority (90%) are students of Franco-American heritage. Thus, for purposes of our research study, we are classifying this as a one-way program as we have defined the model–there is one ethnolinguistic group being schooled through their two community languages (rather than two language groups receiving schooling through their two languages). Both one-way and two-way are for all practical purposes the same type of bilingual program, in that both are integrated, mainstream, enrichment models, designed for all students who choose to attend. But in a context such as northern Maine where almost all students are of the same ethnolinguistic background, the classes include fewer students who are proficient in one of the two languages–in this case, French. In the program, these francophone students have less access to peer models who speak, read, and write French proficiently, to stimulate the development of natural French language acquisition. They are therefore more likely to develop higher proficiency in English (their stronger community language) than in French.

Contrasting Patterns in this Region

Higher English proficiency. This particular context for one-way bilingual education is somewhat different from any of our other research sites, so it provides an interesting contrast. First, these francophone students were reasonably proficient in English at the start of the project. In fact, on self-rating scales administered to students in Grade 2, students stated that English is the language most often used in all social domains, including the home. Students tended to rate their ability to speak English as high and their ability to speak French as moderately low. On standardized tests in English given in 1993-1994, before the program started, students designated as the target group because they were less proficient in academic English initially scored as a group at the 40th NCE (31st percentile) on the subtests of reading and mathematics of the California Test of Basic Skills. In contrast, the comparison group of high-achieving francophone students in these two school districts reached the 58th NCE on the reading subtest and the 60th NCE on the mathematics subtest by the end of elementary school. Thus, one goal of the project was to raise the academic achievement of the lower-achieving francophones to at least comparable levels with their counterparts who were doing quite well in school. This starting point for the lower-achieving francophone students is significantly higher than that of any of our other subjects in other research sites. But the ultimate goal is gap reduction, so in our findings, we examine the students' starting point and follow their progress across time from their initial achievement level to their end attainment as of the final year of data collection.

Heritage language and culture restoration for purposes of economic development. A second distinction from our other research sites is this project's focus on restoration of a minority language, as a means to promoting higher academic achievement, eventually leading to economic revitalization of the region. This one-way bilingual program can be categorized as focused on linguistic and cultural revitalization, incorporating both language restoration of the students' heritage language as a major goal, as well as bicultural identity formation, for the building of higher self-esteem among the francophone students. In this context, the schools are working on promotion of the heritage language of their region, even though the francophone community mostly speaks the majority language, English.

This goal was initially difficult to promote in the community. French had been denigrated for most of the parents' lives. Furthermore, the particular French variety spoken in the region was perceived negatively. Yet the region is quite isolated from the English-speaking United States. It is 350 miles to Portland, Maine, and 200 miles to any other substantial urban area of the U.S.; and the harsh winters frequently make these large distances impassable. It is a quick drive to French-speaking Canada, the main social and economic stimulus for businesses in Northern Maine. Proficient adult bilinguals could assist the economic growth of the region. A school board member explains, "The world's getting smaller. We have NAFTA (the North American Free Trade Agreement), and many of our businesses cater to Canadian tourists and the French-speaking elderly population."

Furthermore, these communities had already experimented with a transitional bilingual program. The implicit goal of the transitional program was to replace the minority language with the majority language–classes in French served as a transition to English, the majority, high status language. But the transitional program did not significantly raise students' test scores. Thus the initiators of the new one-way enrichment bilingual program chose to make the goals more explicit–to foster true additive bilingualism and biliteracy in both French and English for all students, as well as to foster knowledge of, and pride in, the local culture.

The school implementers intended to have a significant influence on improving the prevailing community attitudes toward the Franco-American/Acadian language and cultural heritage. Also they wanted to improve the language and literacy skills and the academic achievement of francophone school-age children. The bilingual school staff expected initial resistance among parents, since teaching through students' heritage language is often perceived as delaying and limiting the children's access to the language of power, English. Thus, in the project's design, they provided for bicultural community involvement, extensive training and support for school personnel, and the development of substantial bilingual/bicultural community resources to create meaningful and challenging academic curricula through the community's two languages. Dramatic changes have already occurred during the five years of implementation of the program to date, as confirmed by school board members and school administrators. "We're seeing a big change in community attitudes toward the French language. The kids just love singing French songs and speaking and writing French. It's like it's become a new fad, for children and adults," stated one school board member.

Status of French and local language varieties. A third unusual aspect of this one-way bilingual project is its focus on developing a language less valued by the local community, but that in other contexts would be considered a prestigious language. French is considered a high-status language around the world, an important language of diplomacy, a language commonly chosen to be studied in schools throughout the world. Of the slightly less than 200 sovereign states of the world, 120 states have adopted English (54 countries), French (33 countries), Spanish, or Arabic as their official language (Baker & Prys Jones, 1998, p. 346). But the French language variety spoken in northern Maine and across the border in Canada has lower status than the "Parisian" variety. This regional variation still has many similarities to its counterpart in France. Regional vocabulary can be perceived positively if examined from the point of view of additive bilingualism. Thus teachers in this program support the bidialectalism that students develop in French, adding to their oral knowledge from the local variety the standard oral and written forms of French. The result is students who are metalinguistically aware and increasingly proficient in academic and business uses of French across multiple regional contexts. During the English portion of the academic day, students get continuing high-level development of oral and written English for academic purposes, which also prepares them for their use of the two languages in the adult world.

Established ethnolinguistic minority. A fourth distinguishing feature of the social context of these two research sites is that the target group for the planned school innovation is not an immigrant group. They are an established ethnolinguistic group with a history that goes back to the first settlements by Europeans in the Americas. While the francophones in this region of the U.S. would be classified as a minority by the U.S. government, they are the majority (over 97 percent) for this region. In fact, the francophones of the northeast U.S. have experienced some sociolinguistic and socioeconomic patterns similar to that of the indigenous Spanish-speaking peoples of the southwest U.S. Schools in the southwest also prohibited the use of Spanish in school during parts of the past century, and the regional varieties of Spanish spoken in the southwest are generally perceived as lower status than the standard varieties of Spanish spoken in each Latin American country and Spain. In rural and urban areas along the U.S.-Mexican border, there is considerable poverty. In northern Maine, the economy is quite depressed on the

U.S. side of the border, but flourishing on the Canadian side. So there are some parallel issues to be examined in the schooling provided for historically established ethnolinguistic groups living near a U.S. border.

Implementation of the School Innovation

Balance of the two languages of instruction. The school program chosen to improve francophone student achievement was started in the school year 1996-1997. Planning for the new project took place during the year prior to implementation. Initially, the planners wanted to implement a 90-10 model, similar to that practiced in Canadian and California bilingual immersion programs, with 90 percent of the instruction in the lower grades (K-1) in the minority language (French), gradually increasing the percentage of instruction in English until by around 4th grade, 50 percent of the instruction would be in each language. However, in the first year of the project, teachers' implementation practices remained closer to a 50-50 balance of the two languages. During the second year of the project, teachers tried to emphasize more French in the early grades, with an approximate ratio of 60-40. The planners pushed hard to increase French instruction to 70 percent for Grades K-3 by the third year of implementation. Resource teachers reported that by Years 3 and 4, the goal of 70 percent French instruction had been achieved in some K-3 classrooms, but not all. Overall, as actually implemented, this could be classified as a 50-50 model, for Grades K-8.

The pressure to teach more in English is strong. Politically, it was difficult to promote the 90-10 model to some of the principals and parents. Generally, teachers were very positive about the program goals but also realistic about the level of bilingualism that could be attained with this amount of French instruction, and they would have preferred increased time in French, given that English is the stronger language of these communities. Research on bilingual immersion programs demonstrates quite clearly that more teaching in the minority language, provided in the 90-10 model, contributes to higher level skills in that language with no apparent loss to English

(Baker & Prys Jones, 1998; Cummins, 2000; Genesee, 1987). But the strong social pressure in the U.S. to learn and use only English overwhelms the ideal teaching situation for proficient bilingualism to be developed.

Grade levels for implementation of program. The program began in 1996-97 in Grades K-2. Since oral usage of the French dialect of the region was common among students of all ages, and their proficiency level in English was relatively high at the start of the program, it was not necessary to introduce the project one grade level at a time. This implementation practice is common in two-way bilingual programs when each group of students is just beginning acquisition of one of the languages of instruction. Using the hands-on curriculum of kindergarten and first grade, students acquire their new language through curricular tasks, so that by the time the students reach second grade and beyond, they have had enough exposure to the new language to be able to do second grade work in their second language. Instead, in these schools the project was implemented by blocks of grade levels to give the program planners time to collect and develop the materials and resources for each block. Thus in the second year, the program was extended to Grades K-5 (K-6 in one school district), and in the third year, the program reached Grades K-7. By the fifth year of the project (2000-2001), there were sufficient numbers of eighth graders who had received their schooling through the two languages to offer coursework in French as well as English to that grade level, completing K-8 implementation. Plans are in place for continuation at high school level, by offering some courses for credit in French.

Teacher credentials. All 15 bilingual teachers in the project have certification for the age group or subject area that they are teaching, 5 have bilingual teacher certification in addition to certification to teach in mainstream classes, and one-third have completed masters degrees. One-third of the 120 teachers in the two school districts are proficient in both oral and written French and English, and three-fourths of the teachers use French for oral purposes. Six of the 12 administrators of the schools use French orally and 3 administrators have some written French proficiency. Thus the teaching and administrative staff are supportive of bilingualism and a sufficient number of teachers proficient in French were already in place when the project began to teach thematic units in the content areas through French. Extensive staff development was provided by the project to expand teachers' repertoire in French in all content areas. The staff are mostly of Franco-American heritage; thus students and staff share a common cultural heritage.

Students. When the program began, there was a total of approximately 900 students in school district #1 and 600 in school district #2. Among the francophone students with lower achievement scores who were designated most in need of the bilingual program, 154 of those in school district #1 chose to participate in the bilingual classes and 104 of those in school district #2 chose to participate in the bilingual classes. Other students doing well academically were allowed to enroll too. In all, approximately one-third of the total student body participated in bilingual immersion classes, most being of Franco-American heritage.

Teaching style. The 15 bilingual teachers were regularly visited by bilingual resource teachers who assisted with staff development and planning needs. As a part of our data collection efforts, the resource teachers completed a survey regarding classroom practices among the bilingual teachers. The issue of translation was especially noteworthy in the findings from this survey. Seven of the 15 teachers stated that they translate for students and that students are allowed to use both languages as needed. The remaining eight teachers maintained the research ideal that in a bilingual class, the teacher separates the use of the two languages and does not translate. The program evaluator mentioned that in his classroom observations he found more reliance on translation than should be allowed for high proficiency in French to develop. Unfortunately, formal measures of French written proficiency were not administered in the project, so there is no way to examine the students' level of academic French development. However, students gained substantially on the oral French measures informally assessed by teachers.

Almost all of the bilingual teachers described their use of thematic lessons, cooperative learning, hands-on instructional materials with lots of visuals and manipulatives, use of microcomputers, multicultural literature, journal writing, and authentic assessment as important aspects of their teaching. All of the teachers reported that they connect the curriculum to the students' experiences, and 13 agreed that they incorporate bicultural knowledge into the curriculum. Six teachers stated that they use the community and parents' knowledge regularly as a resource for student learning. Nine of the bilingual teachers integrate art, music, and drama into their thematic units that develop language arts, mathematics, science, and social studies knowledge.

Revitalization of Franco-American/Acadian culture. To stimulate the connections to community and cultural heritage, the program directors and resource staff have arranged many varied activities that have helped students and staff and the community revisit and celebrate their cultural heritage, for raising self-esteem in the community, with the ultimate goal being economic revitalization of the region. These activities have included high school-elementary school partnerships for students to read books in French together; parents' participation in storytelling and book reading in French; guest speakers with backgrounds in Acadian and Native American history and culture; field trips to nearby Acadian and Quebec cities and villages; francophone state senators' and university professors' presentations to school board members, administrators, and teachers; numerous courses and training workshops for teachers on Franco-American/Acadian history and culture and French language and literature for each age group; positive newspaper articles and TV news programs disseminating accomplishments of the bilingual program; developing a resource collection of videos for families on Franco-American/Acadian culture; intensive summer French language institutes for teachers and students in France; and co-sponsoring community events with the Acadian Archives, a state cultural performance center, a state French theatre group, the National Park Service, local chambers of commerce, state universities, the Franco-American Center, and associations connected with French-English bilingual immersion programs in Canada. Parent organizations help sponsor some of these events and the parents of the immersion program print regular issues of a newsletter to keep the community informed and to encourage new parents to enroll their children in the program.

Development of French proficiency. Since the program conducts no formal assessments of the children's developing French proficiency, a few informal measures will be mentioned. One was a self-evaluation by second grade students of their oral communicative proficiency in French, conducted by staff during the third year of the program. A score of 1 indicates great difficulty in communication and a score of 5 indicates that communication is effortless and natural. Students rated themselves at a 3.8-3.9 level when asking for a telephone number or describing members of family. For expressing personal feelings, explaining rules of a game, convincing someone to get involved, and explaining the contents of a course, they rated their communicative skills in French in the mid-range (2.81-3.22). Relating events in a movie was slightly harder (2.66), placing an order for a meal still harder (2.28), discussing important personal problems more difficult (2.19), and discussing point of view on political system was the most difficult of all to do in French (1.66), as would be natural for a child of this age group.

Teachers regularly conducted informal assessments of students' French proficiency development, but these were not available to the researchers. A parent's words best describe the feelings expressed by both the teachers and parents in the program: "It's a fantastic program! We have no regrets of putting her in the program because she has picked up so much. Kristin reads and writes French very well. She's at the top of her class. Even in math concepts in French, she just picks it up like a sponge ... and it has not bothered her English. It's amazing, just wicked amazing! It's unbelievable the difference; she has picked up tremendously. It's been a great challenge for her and myself. The teachers are excellent."

Summary of Social Context and Implementation Findings

An evaluator of the program summarizes the linguistic and cultural goals of this program, contrasting this with the reality of its social context:

> This dual-language immersion program constitutes an attempt by a linguistic minority to revitalize its culture and language. Unfortunately, this is not an easy task because the 'reversing language shift' process is filled with challenges and obstacles that few linguistic minorities surmount (Fishman, 1989, 1990). Ideally, a community with such a strong demographic capital (close to 97% of French ethnolinguistic origins) should have maintained a strong vitality. However, the community did not have sufficient 'institutional completeness' (Breton, 1964) to develop a community life capable of fostering intergenerational transfer of the group's mother tongue. Such a task was manageable until relatively recently, even without having access to French schooling, because of a certain degree of isolation, proximity to other Francophones in the neighboring provinces of New Brunswick and Quebec in Canada, and an economic lifestyle that did not require a high degree of education or mobility. Today, the growing urbanization, the highly influential effects of the mass media, the more pervasive contacts with the dominant language and other factors contribute to an increasing difficulty to maintain intact one's culture in a minority context. Furthermore, until recently, the use of French at school was prohibited and punished. Many parents have been left stigmatized by their negative experiences and low self-esteem. The bilingual education program is an attempt to counter negative attitudes and to promote pride in the community. The challenge is great because a large proportion of the children attending school today have not acquired French as a first language despite the fact that their parents and many of the same generation community members still understand and speak the language.

> The socializing process in French is now left almost exclusively to the school. The school has the arduous task of counterbalancing the strong forces of assimilation now present in society. Such a task would be a momentous challenge even if the whole school was a unilingual refuge in French. The challenge is even greater within a bilingual school where the dominant language is clearly English. (Landry, 1997, pp. 15-16)

Landry proposes continuing to create within the schools "community life" where grandparents, parents, teachers, and children can meet and participate in meaningful social and cultural activities that will promote pride and legitimize the affirmative expression of a bilingual/bicultural identity. Increasing the percentage of time devoted to teaching in French while maintaining the high standards in the teaching of the English language will also contribute to higher levels of additive bilingualism. Ironically, for this research study, our only quantitative measures are student performance on English academic achievement tests, but these measures do demonstrate the powerful stimulus of receiving enrichment schooling through two languages at no cost to English.

Results in Student Academic Achievement

Cross-sectional analyses. Our analyses include cross-sectional, quasi-longitudinal, and longitudinal views of the data, through descriptive, analysis of variance, and multiple regression analyses. The cross-sectional analyses are presented in Tables A-1 through A-4. These first four data displays do not follow precisely the same group of students across time and therefore they are labeled cross-sectional, although there is very little student mobility in these two school districts, so many of the students who started bilingual immersion classes remained in those classes throughout the years of this study. These tables examine all students attending bilingual immersion classes in 1997, 1998, 1999, and 2000, and compare their performance to all students in the English mainstream classes, as measured by their normal curve equivalent (NCE) scores on the Terra Nova, a standardized, national norm-referenced test, on the reading, language, and mathematics subtests.

As can be seen in Table A-1, in 1997, with the new program implemented in Grades K-2, the bilingual immersion students outperformed the monolingually schooled students at the end of the first year of the program by at least 5 NCEs in reading, language, and mathematics. Also, the bilingually schooled students scored well above grade level, except for the second graders' math performance, which was slightly above the 50th NCE/percentile and thus on grade level. It was expected that the bilingual immersion students would score lower than monolingually schooled students in the first year of the program, as is found in most research studies on bilingual education. However, these students did quite well in Grades 1-3, during the first two years of implementation. In Table A-2, the fourth and sixth graders in 1998 may have scored lower because this was the first year of implementation of bilingual instruction in these grades, as the program was expanded from K-2 to K-6 in this year.

Since both school districts' typical performance on these tests is above the 50th NCE/percentile, it is remarkable that by 1999 (see Tables A-3 and A-4), the bilingual immersion students were outscoring the monolingually schooled students at all grade levels, sometimes by very significant amounts. (In this research, the criterion for statistical significance is set at alpha<.05, unless otherwise noted.) As seen in Table A-3, on the 1999 Terra Nova, the bilingual immersion students outperformed the monolingually schooled students at every grade level by 4-17 NCEs, except second grade math, fifth grade reading, and fifth grade language arts, which were 3 NCEs lower, and not a significant difference, statistically or practically. On the 2000 Terra Nova (Table A-4), the bilingual immersion students again outperformed the English mainstream students, except in second grade language arts (3 NCEs lower–not significant), second grade math (6 NCEs lower–the only lower difference with significance) and seventh grade math (1 NCE lower–not significant). By the end of seventh grade, after three years of bilingual schooling in French and English, the bilingual immersion students were scoring at the 57th NCE (63rd percentile) in reading, the 60th NCE (68th percentile) in English language arts, and the 55th NCE (60th percentile) in math. In the last year of testing for this study (2000), the bilingual immersion students consistently scored at or above the 55th NCE (60th percentile) in every subject and every grade level, except for second grade math at the 48th NCE (47th percentile).

Quasi-longitudinal analyses. Figures A-1 and A-2 and Table A-5 present quasi-longitudinal analyses, meaning that the same groups were followed across time (e.g. those with one year of bilingual schooling, those with two years, etc.), but there is no available pre-test measure to compare to the post-test scores in this particular analysis. These figures clearly show the impact that the bilingual immersion program had on the students who were designated as most in need of the program. Franco-American students who were achieving less well in the two school districts were identified as a target group for the bilingual program, when it was first conceived. At the end of the school year 1993-94, this group of lower-achieving students was scoring at the 40th NCE in reading and mathematics on the California Test of Basic Skills (CTBS). In the figures and tables this group is designated as "Former LEP" (limited-English-proficient). This group of former LEPs is made up of two groups–those who received the bilingual immersion program and those who received English mainstream instruction. The other group, labeled "Non-LEP," is also of Franco-American heritage, but they were achieving above grade level when they began the bilingual immersion program, at the 58th NCE in reading and the 60th NCE in math on the CTBS in 1994.

As can be seen in Figure A-1 and Table A-5, the students designated former LEP, who tested at the 40th NCE (31st percentile) in 1994 on the reading subtest of the CTBS, gained with each additional year in the bilingual immersion program on the reading subtest of the Terra Nova, from the 47th NCE (1 year of bilingual schooling), to the 51st NCE (2 years), the 56th NCE (3 years), and reaching the 62nd NCE (71st percentile) after 4 years of bilingual schooling. For the four-year group, this is a steady and significant gain of 22 NCEs in reading achievement–both statistically and practically significant, and a difference equivalent to a full national standard deviation. The former LEP comparison group, taken from the same group of low-achieving francophone students, were those whose parents chose for their children not to be schooled in the bilingual classes. This group of former LEP students, schooled all in English, ended at the 48th NCE in reading in the year 2000, a significant but smaller gain of 8 NCEs. Thus, the bilingual immersion students gained an average of 5.5 NCEs per year, while the English-instructed students gained an average of 2 NCEs per year.

In the language arts subtest, former LEP students made similar gains with each additional year of schooling in the bilingual immersion program, from the 46th NCE to the 59th and 58th NCEs, finishing at the 61st NCE (70th percentile) after four years of bilingual schooling. Their four-year comparison group being schooled all in English was at the 50th NCE on the language arts subtest in 2000. In the math subtest, former LEP students in bilingual classes achieved at the 48th NCE after one year, the 53rd after two years, down to the 47th after three years, and at the 59th NCE (66th percentile) after four years in bilingual immersion. In 2000 their comparison group schooled all in English was at the 50th NCE in math.

The students in the bilingual immersion program who were designated as non-LEP, those achieving above grade level when the program started, also benefitted greatly from their schooling through two languages. In 2000, the non-LEP students in the all-English curriculum scored at the 53rd, 56th, and 56th NCEs respectively in reading, language, and math; while their non-LEP counterparts who had received four years in the bilingual French-English curriculum scored on the same three subjects at the 61st, 61st and 59th NCEs. Overall, these results are very significant, statistically and practically, strongly favoring the bilingual immersion program.

Longitudinal analyses. The remaining descriptive analyses, examining the data from a longitudinal perspective, are presented in Figures A-3 through A-5 and Tables A-6 through A-11.

These analyses consist only of those students with pre-tests in 1997 and post-tests in 2000. Note that the pre-tests were administered after one year of program operation; thus, the pre-post gains do not include effects from the first year of the program. These figures and tables again demonstrate the high achievement of the bilingual immersion students, in comparison to the monolingually schooled students. The different achievement levels are most evident when examining the students who were former LEPs. On the 1997 reading measure, after one year of the program, the former LEPs in bilingual classes were 9-12 NCEs above the achievement level of the former LEPs in the all-English classes at each grade level, except fifth grade at 3 NCEs above. On the 2000 reading subtest at all grade levels these same bilingual students were 6-10 NCEs above their comparison group attending all-English classes. Similar patterns occurred in the language arts and math scores of the two former LEP groups, with the bilingual students outperforming the all-English students by 1-12 NCEs, except for three cases where both groups scored equally high.

Three cautionary notes should be mentioned for interpreting the gain scores in Tables A-6, A-8, and A-10. When the numbers of students are broken down by grade level and by number of years in the program, the numbers in each group are sometimes too low for the test score mean to be reliable. As a criterion, we suggest that when the number (N) for a group is less than 10, the average scores should not be considered. Since the group sizes in our longitudinal analyses are quite low, we consider the quasi-longitudinal analyses to be more valid for decision-making purposes.

The second point regarding interpreting gain scores as measured in NCEs (normal curve equivalents) or percentiles is that we want to make sure the readers understand the difference between these types of scores and the scores given by teachers on classroom tests or scaled standard scores on norm-referenced and criterion-referenced tests. The NCE is not a cumulative score of the total number of points correctly answered on the test. Instead, both NCEs and percentiles are rankings of how well a group of students did in relation to the typical performance of all students in the U.S. However, the amount of student achievement in percentiles changes across the range of percentile values, because of the shape of the normal distribution. NCEs correct this problem and thus may be considered as equal-interval or corrected percentiles. The 50th NCE/percentile means that 50 percent of the students in the U.S. at that grade level scored below that level and 50 percent scored above that level of performance. If a group of students stays at the same NCE level of achievement from one school year to the next, making a zero NCE gain, that means that they have made one whole year's progress. If they were on grade level (around the 50th percentile) the past year, a zero NCE gain means they stayed on grade level over one year's time. For students to gain in NCEs from one year to the next, it means that they have made more than one year's progress during the year. Scoring 2-3 NCEs above or below the previous year's performance is generally within the standard error of the mean, so that amount of change is not considered significant. However, a difference of 4 NCEs or more can be considered significant, since this difference is equivalent to an effect size of 0.2 or more.

The third issue also involves interpretation of the gain scores, in the third column of each of Tables A-6 through A-11. In an analysis where students are initially scoring very low (e.g. the 10th NCE, a common starting point for LEP students when first tested on norm-referenced tests in English), gain scores are meaningful and important, since the overall goal is gap closure when comparing to typical native-English speakers scoring at the 50th NCE. However, it is worth noting that pre-test scores may be "falsely low" if obtained before the LEP student has sufficiently mastered enough English to take a test administered in English. Thus, in a short-term study comparing beginning-of-year pre-test scores to end-of-year post-test scores, the resulting gains may be too large because the pre-test scores were unreliable. This problem tends to disappear as LEP students learn enough English to enable them to effectively take the test on the same basis as native-English-speaking students. Thus, a long-term study that follows LEP students' annual gains for several years avoids this problem while short-term studies may suffer from it.

Groups that initially are scoring low need to make more than one year's progress each year for several years in a row to eventually close the gap. But in these two school districts, the students who were not former LEPs were scoring at or above the 50th NCE at the start of this program. Those groups of students in these tables who are initially scoring at a high level–e.g. the 55th-60th NCE–generally reach a ceiling. In other words, high achieving students do not typically continue to achieve higher with every year of school, but at some point, their scores reach an above-average range and stay there. Thus the gain scores are less meaningful for students already scoring above grade level. Some columns show a net loss of 2-3 NCEs between the pretest in 1997 and the posttest in 2000. But if the students' scores were already high on the pretest, that net loss is not considered significant (because it is less than two-tenths of a national standard deviation, expressed in NCEs).

Tables A-7 (reading), A-9 (language arts), and A-11 (math) present the longitudinal test results combined across all grades, so that the number of students in each group is sufficiently large to be able to make more reliable comparisons. These analyses show patterns similar to the cross-sectional results, continuing to confirm that the bilingually schooled students, both in 1997 and in 2000, have clearly outperformed their monolingually schooled comparison groups.

In 1997, on reading, language arts, and math, the former LEP students in bilingual classes scored at the 55th, 60th, and 59th NCEs–8, 7, and 6 NCEs higher than their comparison group, the former LEP students in all-English classes. These two groups of former LEPs started at the 40th NCE in reading and math achievement on the norm-referenced test administered the year before the program began. On the 2000 test examining the same three subjects, the former LEP students in bilingual classes scored at the 56th, 59th, and 55th NCEs–8, 8, and 3 NCEs higher than their former LEP comparison group attending all-English classes. This testing includes Grades 4-7, so that even with the increased cognitive complexity of the middle school tests, the bilingually schooled students have been able to maintain their above-grade performance.

The non-LEP comparison groups followed a pattern of achievement similar to that of the LEP comparison groups. In 1997, non-LEP students schooled bilingually scored at the 62nd, 65th, and 65th NCEs–4, 4, and 3 NCEs higher than their monolingually schooled counterparts. In 2000, the bilingually schooled students scored at the 60th, 63rd, and 63rd NCEs–5, 4, and 5 NCEs higher than their comparison group in all-English classes. These two groups combined started at the 58th and 60th NCEs in reading and math respectively in the year before the program began.

Thus, among both LEPs and non-LEPs, those who were schooled bilingually outscored those schooled monolingually after both one year and four years of the bilingual program. All of these results–cross-sectional, quasi-longitudinal, and longitudinal–dramatically demonstrate that students schooled through two languages outperform those schooled through one language. These bilingually schooled students have also acquired French at no cost to their English achievement.

Repeated measures analyses of variance. In addition to tests of practical significance of findings that rely on effect sizes, we have conducted tests of statistical significance. We rely mainly on practical significance, given that the power of statistical tests is very much influenced by sample sizes, leading to Type II errors (failure to find statistical significance) when sample sizes are too small, and to Type I errors (false finding of statistical significance) when sample sizes are too large. Thus, since group sizes are routinely small in the Maine data, we believe that practical significance of observed differences among groups, expressed in conservative terms of fractions of a national standard deviation of 21.06 NCEs, is a better guide for policy making than is statistical significance of differences.

In conducting statistical tests of significance where both pre-test and post-test scores are available, and where the measurement scales are the same for both, we have chosen repeated-measures ANOVA to assess the observed differences both between groups and within groups. The repeated-measures factor is the pre-post achievement test measure (e.g., Total Reading, Total Math, Total Language) and the independent variables are Program Experience (yes vs. no), LEP Status (LEP vs. non-LEP), and Grade in 2000. Since pre-test and post-test scores are from the same students in a longitudinal study, these scores are correlated, and repeated-measures ANOVA makes use of this to reduce the error term in the F-test, and thus to increase the power of the statistical test. In effect, repeated-measures ANOVA is an extreme form of blocking, since we are blocking on each subject, thus completely removing from the error term all variability among subjects because of individual differences. In repeated-measures ANOVA, the independent variables are assessed not as a main effect, but as an interaction between the independent variable and the pre-post factor. Finally, in all repeated-measures tests described below, the alpha-level for statistical significance is set at .05.

Tables A-12 through A-17 provide the results of the repeated measures ANOVA tests where pre-test and post-test scores on Total Reading achievement (Tables A-12 and A-13), Total Language achievement (Tables A-14 and A-15) and Total Math achievement (Tables A-16 and A-17) are examined in succession. In each pair of tables, the students were nested within the independent variables Program Experience, student LEP Status, and Grade as of the year 2000 in the first table, and within Program Experience and LEP Status in the second table.

In Tables A-12 and A-13, the factor for pre-post Reading between program years 2 and 5 is not significant, and the interactions between pre-post and each independent variable are also not significant, indicating that there is no significant difference between pre- and post-test NCE scores overall or among the groups of the independent variables. Since "no significant difference" in this case means a pre-post gain of zero NCEs, we interpret this to mean that all students have maintained their relative positions in the norm group over time during program years 2-5. Thus, they have made one-year's-progress-in-one-year's-time during each year of the program. The tests of between-subjects effects indicate that the students defined by variables LEP Status and Program Experience were significantly different at both pre-test and at the post-test. Table A-7 provides the pre-test and post-test means for these groups and specifies the direction of these differences; non-LEP scores are higher than LEP scores and the scores of students in the program are higher than the scores of students not in the program. However, it is well worth noting that these scores are measured over the 1997-2000 period only, since the first formal student testing in the program did not occur until Spring 1997. Thus, these 1997-2000 analyses do not reflect program gains made during the first year of program operation in 1996-97, since there was no formal pre-test in Spring 1996. In other words, these 1997-2000 comparisons may well underestimate the program's true effect because any achievement gains made during 1996-97, the program's first year, are not included.

In Tables A-14 and A-15, the pre-post factor of interest is Total Language achievement as measured in Spring 1997 and in Spring 2000. Here, students who were in grade 4 in 2000 (and grade 1 in 1997) show a significant drop in average NCE score of more than 6 NCEs. There are also decreases in the mean NCEs for the grades 5, 6, and 7 in year 2000, but these are smaller, verging on non-significance. Interestingly, it was the non-LEP students, not the LEP students, who contributed much of the observed pre-post decrease in mean NCEs in Total Language. This was true for both the non-LEP students in the program and those not a part of the program. Apparently, the non-LEPs' already high NCE scores were subject to a ceiling effect that did not affect the LEP students as much over time. There were no significant differences among the groups of the between-subjects variables LEP Status and Grade in 2000, but there was a significant difference between program participants and non-participants, with program participants scoring slightly higher at both 1997 and 2000 testings.

In Total Math achievement, as shown in Tables A-16 and A-17, there was a statistically significant decrease between 1997 and 2000 in student math scores. As shown in table A-10, this decrease occurred among the groups in grades 4 through 7 in Year 2000. This finding is supported by the significant interaction between the Pre-post factor and Grade as shown in Table A-16. Thus, students' NCE scores tended to decrease as the 2000 grade approaches the middle school years, indicating an across-the-board increase in the difficulty of the math test items for all groups as the grades proceed from Grade 4 to Grade 7. There were no significant interactions between Pre-post and Program Experience or between Pre-post and LEP Status, indicating stable trends for these groups between 1997 and 2000. The tests of between-subjects effects indicate a significant difference between LEPs and non-LEPs in math achievement, with non-LEPs having higher scores in both 1997 and 2000.

Stepwise regression analyses. In Table A-18, we used hierarchical stepwise regression to assess the potential impact of two variables on the former LEP students' reading achievement test scores in the year 2000. The procedure is described by Cohen and Cohen (1975).

Each potential predictor is entered into the regression equation first, thus maximizing its opportunity to produce an incremental increase in multiple R squared (R^2). Then each potential predictor is entered into the regression equation last, and the resulting increment in R squared is used to estimate its unique impact on achievement after variance of the first predictor has been accounted for. In this way, we are able to arrive at an estimate of the unique effect of each predictor on reading achievement, and an estimate of their shared effect on achievement.

When the variables "Socioeconomic Status" (SES) as measured by free or reduced lunch, and "Years in Bilingual Classes" are each introduced first, R squared increases from zero by .06 (SES) and .085 (Years in Bilingual Classes) respectively, indicating that the number of years attending bilingual classes exerts a stronger effect on eventual reading achievement in 2000 than former LEP students' socioeconomic status.

When each variable is entered last, the unique effects of each variable (as indicated by the increment in R squared) are estimated at R^2 change=.037 (F=3.673, df=1,86, p<.06) for SES and R^2 change=.06 (F=5.9, df=1,86, p<.02) for Years in Bilingual Classes. The variance shared between these two variables is estimated at .025. This indicates that SES does not exert a statistically significant impact on eventual student reading achievement ($\propto$=.05) but that Years in Bilingual Classes is a statistically significant determinant of eventual reading achievement. In addition, since shared variance could be attributed to either predictor, the impact of Years in Bilingual Classes could be as high as .085 (F=8.06,df=1,87, p<.01). This is worth noting because the number of years that students attend bilingual classes is a "changeable" variable, in that it can be influenced by policy decisions to adopt effective programs for LEP students, whereas students' socioeconomic status is much more difficult (if not impossible) for the school district to change. This means that decisions to adopt one-way and two-way dual language programs for LEPs might influence as much as 8.5% of eventual LEP reading achievement.

As shown elsewhere in this report, we have observed in other districts that the impact of the program developed for LEP students is substantially higher than seen here when less effective program alternatives (e.g., ESL pullout) are compared to more effective program alternatives (one-way and two-way dual language education–also called bilingual immersion and developmental bilingual education). In all school districts, the effects of socioeconomic status on student achievement are modified (reduced) when more effective programs are adopted. This offers strong evidence that the negative effects of socioeconomic status on student achievement can be mostly "reversed" or overcome when LEP students are provided with effective bilingual program alternatives.

Conclusions

The data from these two rural school districts in northern Maine demonstrate the high levels of student achievement that is possible when students are schooled through two languages. The heritage language of this community, French, has been in strong decline in this region over the past half-century. The power and status language is English. Yet with the commitment of the school administrators and school boards of these two school districts, those families who have chosen for their children to be schooled in both French and English are experiencing dramatic renewal of their heritage language at no cost to their children's English achievement. Overall, those students schooled bilingually are outperforming those schooled monolingually.

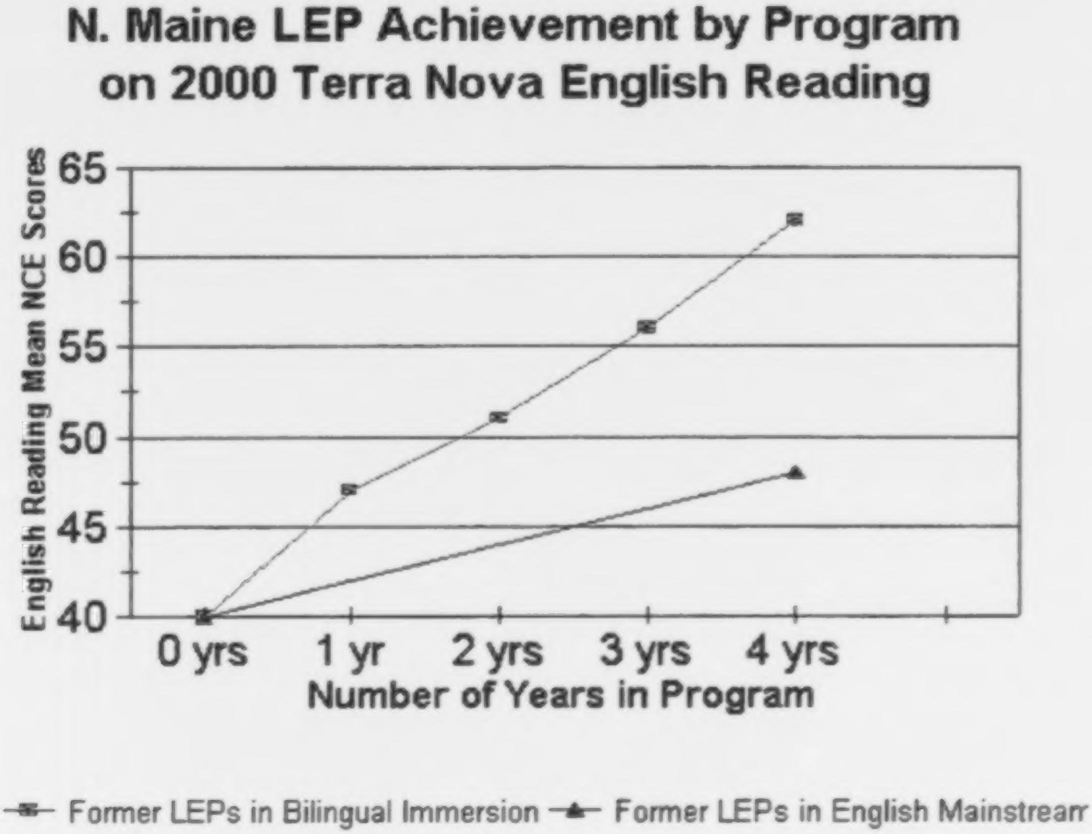
The students who were designated as limited in English proficiency before the program began had a significant command of English, in comparison to similarly classified students in other school districts in the U.S. As a group, just before the program began, these students scored at the 40th NCE (31st percentile) in English reading and mathematics. In other states with large numbers of LEP students, often the 40th percentile (45th NCE) is the level at which students are reclassified as fluent in English and ready for the mainstream. Thus these former LEP students were close to the level of reclassification as fluent English speakers ready for the mainstream when they began the program. But during the first four years in the program, they went from the 40th NCE to the 62nd NCE in reading achievement across the curriculum (see Figure A-1). That is dramatic achievement gain for this particular group. Clearly, these former LEP students have benefitted significantly from their schooling in both French and English. They have made significant gains in their academic achievement in English, and at the same time, they have acquired proficiency in their heritage language, French.

Both school districts are achieving at a significantly high level for all groups of students. The comparison groups being schooled monolingually through English are doing quite well, staying above the 50th percentile, even when the academic difficulty increases in the secondary years.

But the students being schooled through their two heritage languages, French and English, are achieving at higher levels than their monolingually schooled peers, and they are adding French to their knowledge base. The community goal with this bilingual program is to produce more student graduates who are academically proficient in both languages of the community, for economic revitalization of the region. Anecdotal stories among school board members and administrators affirm that students and families have significantly benefitted from this school program, through higher self-esteem among former low-achieving francophones who are now high achievers along with their student peers, and through greater pride in the use of French in the community. English is not diminishing in influence–it remains a strong part of the economy. But now these communities have developed the potential for graduating adult bilinguals who will be able to use their two languages in the workplace to stimulate future economic growth as they serve this U.S.-Canadian bilingual region.

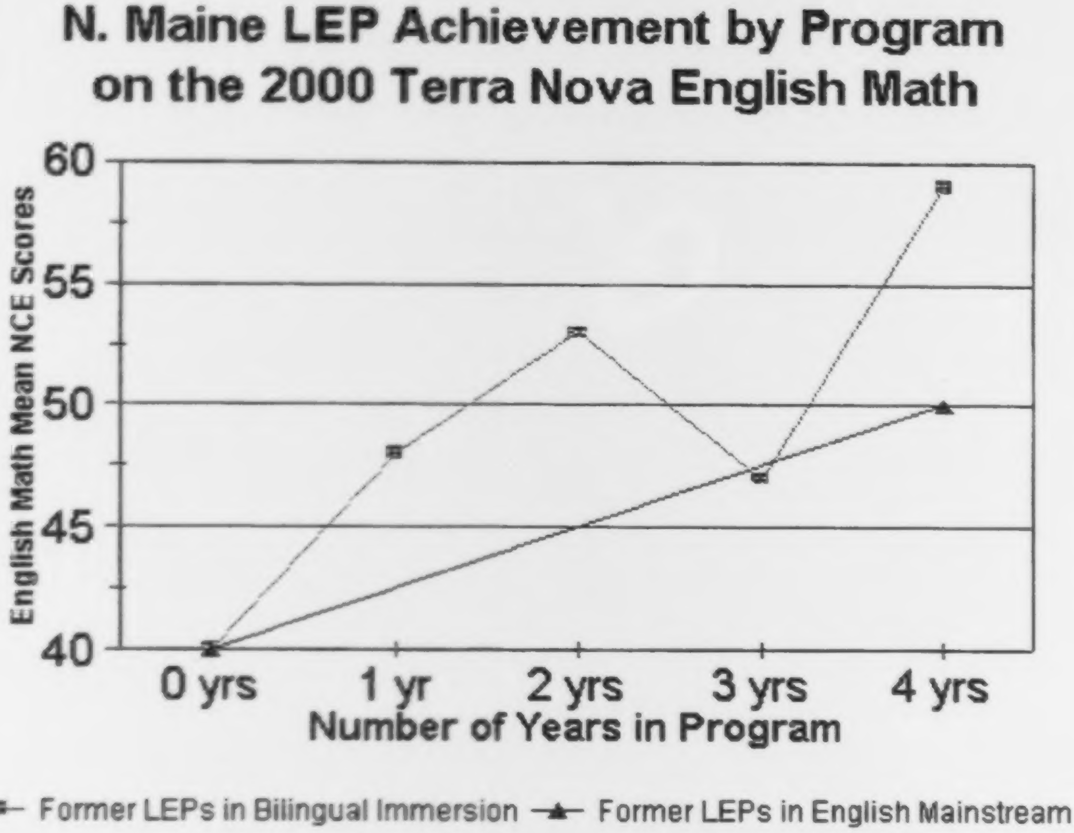
Northeast U.S. Rural Research Sites – Figures

Figure A-1
Quasi-longitudinal analyses



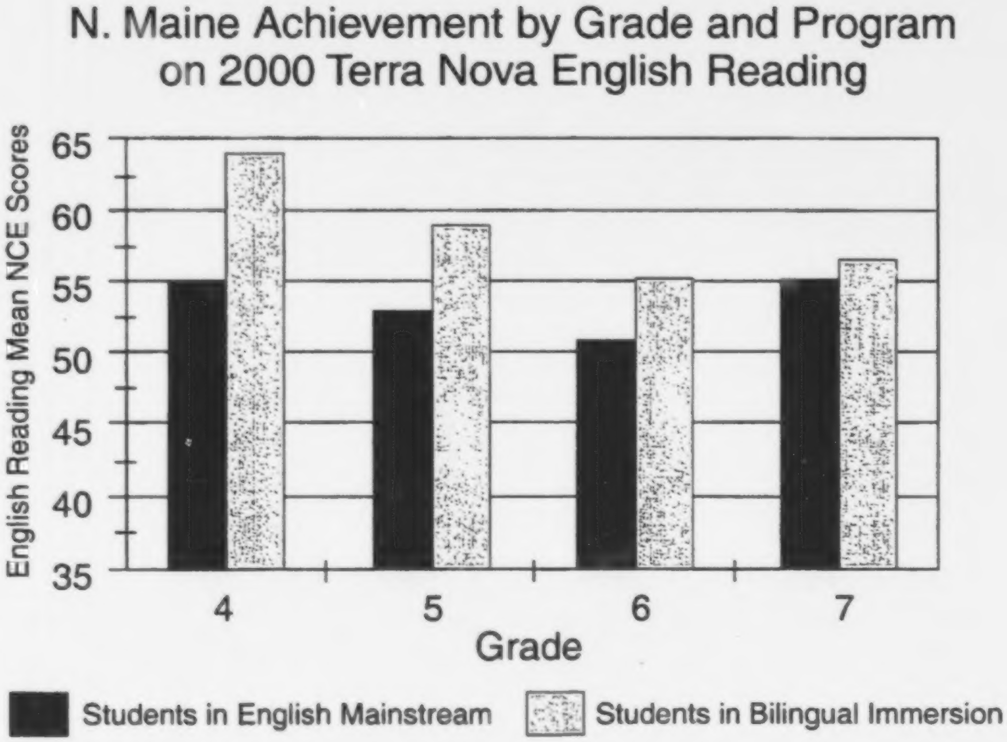
(See Table A-5 for number of students by program and by number of years in program.)

Figure A-2
Quasi-longitudinal analyses



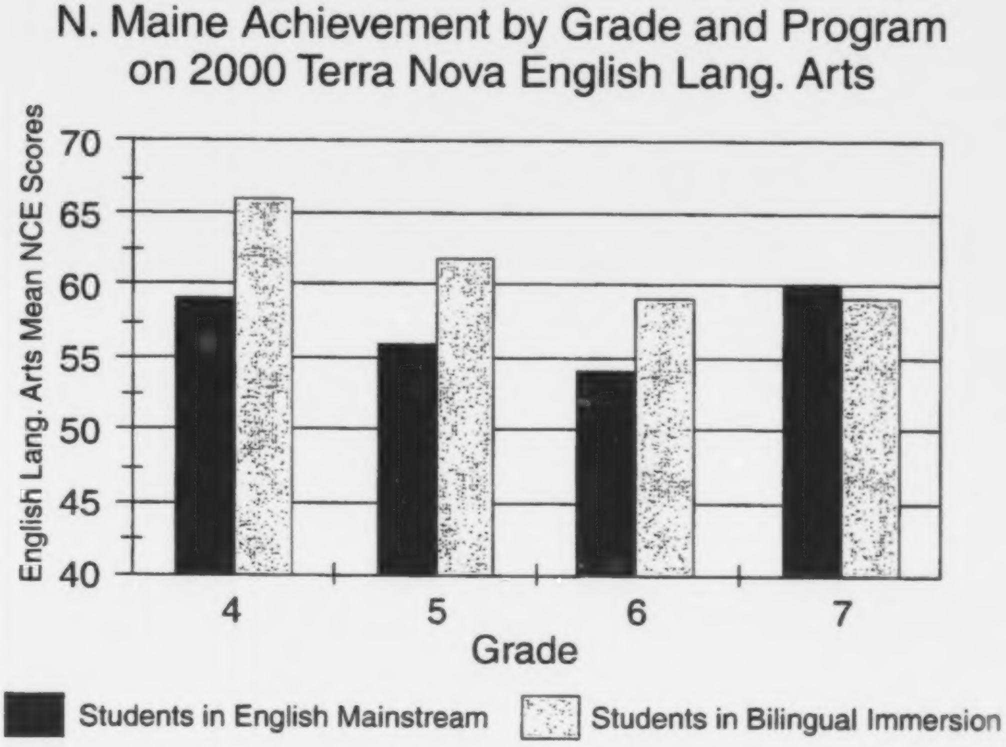
(See Table A-5 for number of students by program and by number of years in program.)

Figure A-3
Longitudinal analyses



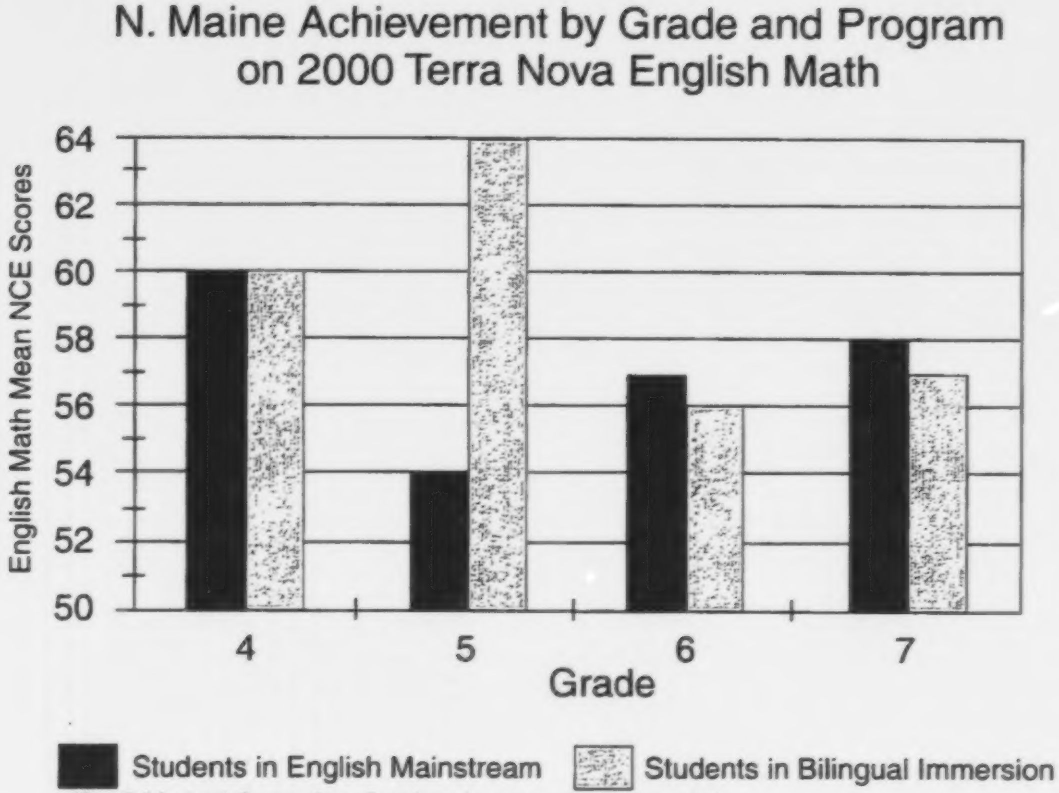
(See Table A-6 for number of students by program and by grade.)

Figure A-4
Longitudinal analyses



(See Table A-8 for number of students by program and by grade.)

Figure A-5
Longitudinal analyses



(See Table A-10 for number of students by program and by grade.)

Northeast U.S. Rural Research Sites - Tables

Table A-1
1997 Reading, Language, and Math Mean NCE Scores on the CTBS/Terra Nova in English for Bilingual Immersion and Non-immersion Students: Cross-sectional Analyses

Grade in 1997	Attended Bilingual Immersion Program?		1997 NCE Scores Total Reading	1997 NCE Scores Total Language	1997 NCE Scores Total Math
1	No	Mean	53.42	56.62	57.17
		N	24	24	24
		Std. Deviation	20.41	18.83	17.04
	Yes	Mean	65.84	64.00	62.89
		N	19	19	19
		Std. Deviation	20.38	16.86	13.71
	Total	Mean	58.91	59.88	59.70
		N	43	43	43
		Std. Deviation	21.10	18.16	15.74
2	No	Mean	55.02	58.56	63.34
		N	56	57	59
		Std. Deviation	19.75	20.86	21.46
	Yes	Mean	62.26	63.50	52.13
		N	31	32	32
		Std. Deviation	18.02	18.27	16.41
	Total	Mean	57.60	60.34	59.40
		N	87	89	91
		Std. Deviation	19.36	20.01	20.46
Total	No	Mean	54.54	57.99	61.55
		N	80	81	83
		Std. Deviation	19.83	20.18	20.37
	Yes	Mean	63.62	63.69	56.14
		N	50	51	51
		Std. Deviation	18.83	17.59	16.20
	Total	Mean	58.03	60.19	59.49
		N	130	132	134
		Std. Deviation	19.88	19.35	19.01

Table A-2

1998 Reading, Language, and Math Mean NCE Scores on the CTBS/Terra Nova in English for Bilingual Immersion and Non-immersion Students: Cross-sectional Analyses

Grade in 1998	Attended Bilingual Immersion Program?		1998 NCE Scores Total Reading	1998 NCE Scores Total Language	1998 NCE Scores Total Math
1	No	Mean	44.07	43.97	45.38
		N	29	29	29
		Std. Deviation	17.83	20.63	15.78
	Yes	Mean	56.87	52.93	56.53
		N	15	15	15
		Std. Deviation	24.70	17.82	21.03
	Total	Mean	48.43	47.02	49.18
		N	44	44	44
		Std. Deviation	21.06	19.98	18.29
2	No	Mean	55.31	59.69	57.28
		N	51	48	50
		Std. Deviation	20.49	20.01	23.34
	Yes	Mean	62.97	71.31	62.28
		N	29	29	29
		Std. Deviation	13.99	16.95	17.33
	Total	Mean	58.09	64.06	59.11
		N	80	77	79
		Std. Deviation	18.68	19.64	21.35
3	No	Mean	54.76	58.05	58.00
		N	63	62	60
		Std. Deviation	21.27	23.33	19.50
	Yes	Mean	61.94	64.88	64.47
		N	34	34	34
		Std. Deviation	15.75	16.86	18.44
	Total	Mean	57.28	60.47	60.34
		N	97	96	94
		Std. Deviation	19.73	21.42	19.28
4	No	Mean	56.17	53.30	53.83
		N	23	23	23
		Std. Deviation	18.56	25.18	20.61
	Yes	Mean	51.93	47.93	46.87
		N	15	15	15
		Std. Deviation	15.51	18.79	11.91
	Total	Mean	54.50	51.18	51.08
		N	38	38	38
		Std. Deviation	17.33	22.75	17.83

Table A-2 (continued)

Grade in 1998	Attended Bilingual Immersion Program?		1998 NCE Scores Total Reading	1998 NCE Scores Total Language	1998 NCE Scores Total Math
5	No	Mean	53.10	56.73	57.10
			51	48	49
			15.48	15.53	18.64
	Yes	Mean	58.54	61.64	68.20
		N	26	25	25
		Std. Deviation	18.37	13.95	16.35
	Total	Mean	54.94	58.41	60.85
		N	77	73	74
		Std. Deviation	16.59	15.09	18.56
6	No	Mean	61.19	58.81	62.90
		N	21	21	21
		Std. Deviation	19.83	16.57	18.60
	Yes	Mean	53.56	51.97	48.03
		N	32	31	32
		Std. Deviation	19.89	18.01	23.53
	Total	Mean	56.58	54.73	53.92
		N	53	52	53
		Std. Deviation	20.03	17.61	22.74
Total	No	Mean	53.92	55.94	56.11
		N	238	231	232
		Std. Deviation	19.45	20.87	20.15
	Yes	Mean	58.28	59.99	58.61
		N	151	149	150
		Std. Deviation	18.02	18.51	20.22
	Total	Mean	55.61	57.53	57.09
		N	389	380	382
		Std. Deviation	19.00	20.05	20.19

Table A-3

1999 Reading, Language, and Math Mean NCE Scores on the Terra Nova in English for Bilingual Immersion and Non-immersion Students: Cross-sectional Analyses

Grade in 1999	Attended Bilingual Immersion Program?		1999 NCE Scores Total Reading	1999 NCE Scores Total Language	1999 NCE Scores Total Math
1	No	Mean	46.00	51.94	44.16
		N	62	62	61
		Std. Deviation	18.61	19.30	16.42
	Yes	Mean	50.84	57.21	48.37
		N	19	19	19
		Std. Deviation	16.76	19.01	18.83
	Total	Mean	47.14	53.17	45.16
		N	81	81	80
		Std. Deviation	18.21	19.25	16.99
2	No	Mean	45.00	44.95	49.67
		N	43	43	43
		Std. Deviation	21.39	22.33	21.59
	Yes	Mean	53.46	58.39	46.49
		N	41	41	39
		Std. Deviation	12.87	17.96	18.20
	Total	Mean	49.13	51.51	48.16
		N	84	84	82
		Std. Deviation	18.15	21.30	19.99
3	No	Mean	55.67	53.52	53.57
		N	54	54	54
		Std. Deviation	17.98	17.80	15.03
	Yes	Mean	73.41	70.41	70.76
		N	29	29	29
		Std. Deviation	15.83	15.81	16.82
	Total	Mean	61.87	59.42	59.58
		N	83	83	83
		Std. Deviation	19.16	18.86	17.62
4	No	Mean	53.32	54.85	54.17
		N	47	47	47
		Std. Deviation	16.96	18.97	20.73
	Yes	Mean	56.67	70.60	59.60
		N	15	15	15
		Std. Deviation	9.29	18.86	15.45
	Total	Mean	54.13	58.66	55.48
		N	62	62	62
		Std. Deviation	15.45	19.98	19.61

Table A3 (continued)

Grade in 1999	Attended Bilingual Immersion Program?		1999 NCE Scores Total Reading	1999 NCE Scores Total Language	1999 NCE Scores Total Math
5	No	Mean	54.34	55.31	55.53
		N	58	58	58
		Std. Deviation	21.12	22.78	22.50
	Yes	Mean	50.73	51.87	55.60
		N	30	30	30
		Std. Deviation	21.07	17.27	16.91
	Total	Mean	53.11	54.14	55.56
		N	88	88	88
		Std. Deviation	21.05	21.03	20.66
6	No	Mean	51.46	54.35	51.60
		N	52	52	52
		Std. Deviation	18.88	19.00	19.53
	Yes	Mean	55.88	57.88	59.04
		N	26	26	26
		Std. Deviation	16.33	18.34	12.40
	Total	Mean	52.94	55.53	54.08
		N	78	78	78
		Std. Deviation	18.09	18.74	17.75
7	No	Mean	59.73	59.22	58.89
		N	37	37	37
		Std. Deviation	17.09	20.16	20.70
	Yes	Mean	66.85	63.69	66.15
		N	13	13	13
		Std. Deviation	14.02	12.43	17.43
	Total	Mean	61.58	60.38	60.78
		N	50	50	50
		Std. Deviation	16.51	18.45	19.99
Total	No	Mean	51.95	53.39	52.14
		N	353	353	352
		Std. Deviation	19.40	20.26	19.83
	Yes	Mean	57.69	60.53	56.96
		N	173	173	171
		Std. Deviation	17.59	18.30	18.56
	Total	Mean	53.84	55.74	53.72
		N	526	526	523
		Std. Deviation	19.00	19.90	

Table A-4

2000 Reading, Language, and Math Mean NCE Scores on the Terra Nova in English for Bilingual Immersion and Non-immersion Students: Cross-sectional Analyses

Grade in 2000	Attended Bilingual Immersion Program?		2000 NCE Scores Total Reading	2000 NCE Scores Total Language	2000 NCE Scores Total Math
2	No	Mean	54.40	58.19	53.81
		N	43	43	43
		Std. Deviation	18.22	23.16	21.01
	Yes	Mean	56.53	54.74	48.35
		N	34	34	34
		Std. Deviation	16.80	16.88	19.64
	Total	Mean	55.34	56.66	51.40
		N	77	77	77
		Std. Deviation	17.53	20.57	20.47
3	No	Mean	43.08	43.67	49.12
		N	49	49	49
		Std. Deviation	15.31	16.97	15.78
	Yes	Mean	57.82	57.45	56.18
		N	33	33	33
		Std. Deviation	18.00	19.19	18.54
	Total	Mean	49.01	49.22	51.96
		N	82	82	82
		Std. Deviation	17.88	19.04	17.19
4	No	Mean	52.06	55.97	57.97
		N	34	34	34
		Std. Deviation	28.12	24.46	23.40
	Yes	Mean	66.09	67.00	63.73
		N	11	11	11
		Std. Deviation	19.98	24.02	20.79
	Total	Mean	55.49	58.67	59.38
		N	45	45	45
		Std. Deviation	26.85	24.55	22.69
5	No	Mean	54.52	57.69	56.48
		N	62	62	62
		Std. Deviation	21.25	23.09	22.51
	Yes	Mean	58.50	60.17	60.63
		N	30	30	30
		Std. Deviation	16.07	17.57	17.93
	Total	Mean	55.82	58.50	57.84
		N	92	92	92
		Std. Deviation	19.71	21.38	21.11

Table A4 (continued)

Grade in 2000	Attended Bilingual Immersion Program?		2000 NCE Scores Total Reading	2000 NCE Scores Total Language	2000 NCE Scores Total Math
6	No	Mean	50.75	53.08	55.77
		N	60	60	60
		Std. Deviation	18.81	23.47	21.70
	Yes	Mean	56.17	59.92	55.79
		N	24	24	24
		Std. Deviation	22.33	23.22	19.24
	Total	Mean	52.30	55.04	55.77
		N	84	84	84
		Std. Deviation	19.89	23.47	20.91
7	No	Mean	53.95	59.02	56.43
		N	60	60	60
		Std. Deviation	17.01	20.41	18.69
	Yes	Mean	56.72	59.83	55.22
		N	18	18	18
		Std. Deviation	15.46	16.48	14.59
	Total	Mean	54.59	59.21	56.15
		N	78	78	78
		Std. Deviation	16.61	19.48	17.74
Total	No	Mean	51.56	54.70	54.95
		N	308	308	308
		Std. Deviation	19.90	22.40	20.59
	Yes	Mean	57.87	58.76	55.67
		N	150	150	150
		Std. Deviation	17.87	19.11	18.82
	Total	Mean	53.63	56.03	55.19
		N	458	458	458
		Std. Deviation	19.47	21.44	20.01

Table A-5

2000 Reading, Language, and Math Mean NCE Scores on the Terra Nova in English for Students Initially Classified as LEP Compared to Non-LEP Students by Number of Years Attending Bilingual Immersion Program: Quasi-Longitudinal Analyses

Number of Years Attending Bilingual Immersion	LEP Status		2000 NCE Scores Total Reading	2000 NCE Scores Total Language	2000 NCE Scores Total Math
0 years (Non-immersion students)	Former LEP	Mean	47.54	49.75	49.69
		N	59	59	59
		Std. Deviation	17.00	20.48	17.84
	Non-LEP	Mean	52.82	55.51	55.86
		N	222	222	222
		Std. Deviation	20.02	22.18	20.90
	Total	Mean	51.72	54.30	54.57
		N	281	281	281
		Std. Deviation	19.52	21.92	20.42
1 year in bilingual immersion	Former LEP	Mean	46.82	45.64	48.00
		N	11	11	11
		Std. Deviation	17.36	21.67	24.46
	Non-LEP	Mean	53.37	54.80	56.27
		N	30	30	30
		Std. Deviation	19.02	23.14	22.73
	Total	Mean	51.61	52.34	54.05
		N	41	41	41
		Std. Deviation	18.61	22.86	23.19
2 years in bilingual immersion	Former LEP	Mean	50.86	58.92	53.49
		N	37	37	37
		Std. Deviation	17.02	19.26	18.93
	Non-LEP	Mean	56.21	59.70	56.77
		N	53	53	53
		Std. Deviation	21.33	19.50	18.83
	Total	Mean	54.01	59.38	55.42
		N	90	90	90
		Std. Deviation	19.75	19.30	18.84
3 years in bilingual immersion	Former LEP	Mean	55.79	58.03	47.41
		N	29	29	29
		Std. Deviation	18.48	19.86	19.51
	Non-LEP	Mean	56.89	56.50	59.63
		N	38	38	38
		Std. Deviation	18.30	19.76	17.46
	Total	Mean	56.42	57.16	54.34
		N	67	67	67
		Std. Deviation	18.25	19.67	19.23

Table A-5 (continued)

Number of Years Attending Bilingual Immersion	LEP Status		2000 NCE Scores Total Reading	2000 NCE Scores Total Language	2000 NCE Scores Total Math
4 years in bilingual immersion	Former LEP	Mean	61.67	61.00	58.92
		N	24	24	24
		Std. Deviation	17.79	19.33	17.31
	Non-LEP	Mean	60.73	60.83	59.23
		N	30	30	30
		Std. Deviation	18.37	19.35	20.95
	Total	Mean	61.15	60.91	59.09
		N	54	54	54
		Std. Deviation	17.95	19.16	19.24
Total (Immersion & non-immersion students combined)	Former LEP	Mean	51.88	54.78	51.43
		N	160	160	160
		Std. Deviation	17.95	20.42	18.96
	Non-LEP	Mean	54.40	56.58	56.68
		N	373	373	373
		Std. Deviation	19.89	21.42	20.39
	Total	Mean	53.64	56.04	55.10
		N	533	533	533
		Std. Deviation	19.34	21.12	20.10

Table A-6

Reading Mean NCE Scores on the CTBS/Terra Nova in English
for Students Initially Classified as LEP Compared to non-LEP Students
by Program Type and by Grade: Longitudinal Analyses

Attended Bilingual Immersion Program?	LEP Status	Grade in 2000		1997 NCE Scores: Total Reading	2000 NCE Scores: Total Reading	1997-2000 Gain in Total Reading
No (Non-immersion students)	Former LEP	4	Mean	45.2000	49.8000	4.6000
			N	5	5	5
			Std. Deviation	17.2829	21.7647	11.0363
		5	Mean	53.5000	53.6667	.1667
			N	12	12	12
			Std. Deviation	20.9870	18.2275	15.8047
		6	Mean	44.0909	41.2727	-2.8182
			N	11	11	11
			Std. Deviation	7.9556	7.5643	6.4159
		7	Mean	44.8182	48.0000	3.1818
			N	11	11	11
			Std. Deviation	9.4108	11.5499	8.9198
		Total	Mean	47.3333	48.0769	.7436
			N	39	39	39
			Std. Deviation	14.7101	14.8278	11.1514
No (Non-immersion students)	Non-LEP	4	Mean	61.6667	56.0000	-5.6667
			N	24	24	24
			Std. Deviation	22.0487	29.4471	30.0835
		5	Mean	55.6667	52.8056	-2.8611
			N	36	36	36
			Std. Deviation	22.6829	20.6520	15.8424
		6	Mean	58.3889	54.5000	-3.8889
			N	36	36	36
			Std. Deviation	18.4612	18.9382	12.8236
		7	Mean	56.2000	57.3667	1.1667
			N	30	30	30
			Std. Deviation	16.2892	16.8962	8.2004
		Total	Mean	57.7143	54.9841	-2.7302
			N	126	126	126
			Std. Deviation	19.8844	21.1807	17.4395

Table A-6 (continued)

Attended Bilingual Immersion Program?	LEP Status	Grade in 2000		1997 NCE Scores: Total Reading	2000 NCE Scores: Total Reading	1997-2000 Gain in Total Reading
No (Non-immersion students)	Total (Former LEP & Non-LEP)	4	Mean	58.8276	54.9310	-3.8966
			N	29	29	29
			Std. Deviation	21.9562	28.0292	27.8636
		5	Mean	55.1250	53.0208	-2.1042
			N	48	48	48
			Std. Deviation	22.0711	19.8874	15.7199
		6	Mean	55.0426	51.4043	-3.6383
			N	47	47	47
			Std. Deviation	17.6216	17.8151	11.5879
		7	Mean	53.1463	54.8537	1.7073
			N	41	41	41
			Std. Deviation	15.5106	16.0617	8.3344
		Total	Mean	55.2606	53.3515	-1.9091
			N	165	165	165
			Std. Deviation	19.2632	20.0386	16.2116
Yes (Bilingual immersion students)	Former LEP	4	Mean	57.2500	57.5000	.2500
			N	4	4	4
			Std. Deviation	41.1370	29.4901	22.4852
		5	Mean	56.3529	59.8824	3.5294
			N	17	17	17
			Std. Deviation	15.7438	16.9554	8.7687
		6	Mean	54.2000	50.5333	-3.6667
			N	15	15	15
			Std. Deviation	16.6699	24.7527	13.8030
		7	Mean	53.5455	55.4545	1.9091
			N	11	11	11
			Std. Deviation	14.8079	13.2315	10.4159
		Total	Mean	55.0851	55.6596	.5745
			N	47	47	47
			Std. Deviation	18.1836	19.9175	12.2807

Table A-6 (continued)

Attended Bilingual Immersion Program?	LEP Status	Grade in 2000		1997 NCE Scores: Total Reading	2000 NCE Scores: Total Reading	1997-2000 Gain in Total Reading
Yes (Bilingual immersion students)	Non-LEP	4	Mean	66.0000	67.1429	1.1429
			N	7	7	7
			Std. Deviation	16.6933	18.3977	8.9894
		5	Mean	63.6957	59.0000	-4.6957
			N	23	23	23
			Std. Deviation	15.3990	17.6249	15.0437
		6	Mean	62.7143	59.7857	-2.9286
			N	14	14	14
			Std. Deviation	16.6615	21.8075	15.4296
		7	Mean	58.2941	56.8824	-1.4118
			N	17	17	17
			Std. Deviation	21.6384	21.1598	12.2987
		Total	Mean	62.2295	59.5246	-2.7049
			N	61	61	61
			Std. Deviation	17.5142	19.4693	13.6642
Yes (Bilingual immersion students)	Total (Former LEP & non-LEP)	4	Mean	62.8182	63.6364	.8182
			N	11	11	11
			Std. Deviation	26.3508	22.0829	14.1550
		5	Mean	60.5750	59.3750	-1.2000
			N	40	40	40
			Std. Deviation	15.7787	17.1280	13.2727
		6	Mean	58.3103	55.0000	-3.3103
			N	29	29	29
			Std. Deviation	16.9286	23.4368	14.3505
		7	Mean	56.4286	56.3214	-.1071
			N	28	28	28
			Std. Deviation	19.0854	18.1844	11.5128
		Total	Mean	59.1204	57.8426	-1.2778
			N	108	108	108
			Std. Deviation	18.0781	19.6674	13.1226

Table A-6 (continued)

	LEP Status	Grade in 2000		1997 NCE Scores: Total Reading	2000 NCE Scores: Total Reading	1997-2000 Gain in Total Reading
Total (Immersion & Non-immersion students combined)	Former LEP	4	Mean	50.5556	53.2222	2.6667
			N	9	9	9
			Std. Deviation	28.7102	24.0717	15.9922
		5	Mean	55.1724	57.3103	2.1379
			N	29	29	29
			Std. Deviation	17.7966	17.4501	12.0378
		6	Mean	49.9231	46.6154	-3.3077
			N	26	26	26
			Std. Deviation	14.3831	19.6918	11.1059
		7	Mean	49.1818	51.7273	2.5455
			N	22	22	22
			Std. Deviation	12.9049	12.7061	9.4855
		Total	Mean	51.5698	52.2209	.6512
			N	86	86	86
			Std. Deviation	17.0512	18.0941	11.7140
	Non-LEP	4	Mean	62.6452	58.5161	-4.1290
			N	31	31	31
			Std. Deviation	20.7807	27.4759	26.8027
		5	Mean	58.7966	55.2203	-3.5763
			N	59	59	59
			Std. Deviation	20.3967	19.6083	15.4308
		6	Mean	59.6000	55.9800	-3.6200
			N	50	50	50
			Std. Deviation	17.9148	19.7003	13.4466
		7	Mean	56.9574	57.1915	.2340
			N	47	47	47
			Std. Deviation	18.1981	18.3239	9.8272
		Total	Mean	59.1872	56.4652	-2.7219
			N	187	187	187
			Std. Deviation	19.2139	20.6960	16.2672

Table A-6 (continued)

LEP Status	Grade in 2000		1997 NCE Scores: Total Reading	2000 NCE Scores: Total Reading	1997-2000 Gain in Total Reading
Total (All students combined)	4	Mean	59.9250	57.3250	-2.6000
		N	40	40	40
		Std. Deviation	22.9653	26.5440	24.7654
	5	Mean	57.6023	55.9091	-1.6932
		N	88	88	88
		Std. Deviation	19.5504	18.8495	14.5834
	6	Mean	56.2895	52.7763	-3.5132
		N	76	76	76
		Std. Deviation	17.3204	20.0703	12.6201
	7	Mean	54.4783	55.4493	.9710
		N	69	69	69
		Std. Deviation	16.9936	16.8397	9.7105
	Total	Mean	56.7875	55.1282	-1.6593
		N	273	273	273
		Std. Deviation	18.8646	19.9778	15.0432

Table A-7

Reading Mean NCE Scores on the CTBS/Terra Nova in English for Students Initially Classified as LEP Compared to non-LEP Students by Program Type: Longitudinal Analyses

Attended Bilingual Immersion Program?	LEP status		1997 NCE Scores: Total Reading	2000 NCE Scores: Total Reading	1997-2000 Gain in Total Reading
No (Non-immersion students)	Former LEP	Mean	47.3333	48.0769	.7436
		N	39	39	39
		Std. Deviation	14.7101	14.8278	11.1514
	Non-LEP	Mean	57.7143	54.9841	-2.7302
		N	126	126	126
		Std. Deviation	19.8844	21.1807	17.4395
	Total	Mean	55.2606	53.3515	-1.9091
		N	165	165	165
		Std. Deviation	19.2632	20.0386	16.2116
Yes (Bilingual immersion students)	Former LEP	Mean	55.0851	55.6596	.5745
		N	47	47	47
		Std. Deviation	18.1836	19.9175	12.2807
	Non-LEP	Mean	62.2295	59.5246	-2.7049
		N	61	61	61
		Std. Deviation	17.5142	19.4693	13.6642
	Total	Mean	59.1204	57.8426	-1.2778
		N	108	108	108
		Std. Deviation	18.0781	19.6674	13.1226
Total (Immersion & Non-immersion students combined)	Former LEP	Mean	51.5698	52.2209	.6512
		N	86	86	86
		Std. Deviation	17.0512	18.0941	11.7140
	Non-LEP	Mean	59.1872	56.4652	-2.7219
		N	187	187	187
		Std. Deviation	19.2139	20.6960	16.2672
	Total	Mean	56.7875	55.1282	-1.6593
		N	273	273	273
		Std. Deviation	18.8646	19.9778	15.0432

Table A-6 (continued)

	LEP Status	Grade in 2000		1997 NCE Scores: Total Reading	2000 NCE Scores: Total Reading	1997-2000 Gain in Total Reading
Total (Immersion & Non-immersion students combined)	Former LEP	4	Mean	50.5556	53.2222	2.6667
			N	9	9	9
			Std. Deviation	28.7102	24.0717	15.9922
		5	Mean	55.1724	57.3103	2.1379
			N	29	29	29
			Std. Deviation	17.7966	17.4501	12.0378
		6	Mean	49.9231	46.6154	-3.3077
			N	26	26	26
			Std. Deviation	14.3831	19.6918	11.1059
		7	Mean	49.1818	51.7273	2.5455
			N	22	22	22
			Std. Deviation	12.9049	12.7061	9.4855
		Total	Mean	51.5698	52.2209	.6512
			N	86	86	86
			Std. Deviation	17.0512	18.0941	11.7140
	Non-LEP	4	Mean	62.6452	58.5161	-4.1290
			N	31	31	31
			Std. Deviation	20.7807	27.4759	26.8027
		5	Mean	58.7966	55.2203	-3.5763
			N	59	59	59
			Std. Deviation	20.3967	19.6083	15.4308
		6	Mean	59.6000	55.9800	-3.6200
			N	50	50	50
			Std. Deviation	17.9148	19.7003	13.4466
		7	Mean	56.9574	57.1915	.2340
			N	47	47	47
			Std. Deviation	18.1981	18.3239	9.8272
		Total	Mean	59.1872	56.4652	-2.7219
			N	187	187	187
			Std. Deviation	19.2139	20.6960	16.2672

Table A-8 (continued)

Attended Bilingual Immersion Program?	LEP Status	Grade in 2000		1997 NCE Scores: Total Language	2000 NCE Scores: Total Language	1997-2000 Gain in Total Language
No (Non-immersion students)	Total (Former LEP & non-LEP)	4	Mean	65.4231	59.4828	-3.8077
			N	26	29	26
			Std. Deviation	20.8752	23.6622	15.8392
		5	Mean	59.9565	56.2083	-4.6522
			N	46	48	46
			Std. Deviation	23.4445	21.1750	21.0736
		6	Mean	57.1522	54.0426	-2.9565
			N	46	47	46
			Std. Deviation	20.2923	21.2449	15.4185
		7	Mean	57.0526	59.6829	3.0263
			N	38	41	38
			Std. Deviation	16.3376	19.9279	13.3000
		Total	Mean	59.3333	57.0303	-2.1410
			N	156	165	156
			Std. Deviation	20.5462	21.2868	17.0212
Yes (Bilingual immersion students)	Former LEP	4	Mean	77.5000	74.0000	-3.5000
			N	4	4	4
			Std. Deviation	30.5232	28.8791	23.6995
		5	Mean	61.4118	62.3529	.9412
			N	17	17	17
			Std. Deviation	15.6247	19.8681	11.2387
		6	Mean	56.0000	54.7333	-1.2667
			N	15	15	15
			Std. Deviation	21.8174	24.0430	18.2345
		7	Mean	59.0000	54.0909	-4.9091
			N	11	11	11
			Std. Deviation	17.3205	18.9761	12.0951
		Total	Mean	60.4894	58.9787	-1.5106
			N	47	47	47
			Std. Deviation	19.7064	21.9391	14.7955

Table A-8 (continued)

Attended Bilingual Immersion Program?	LEP Status	Grade in 2000		1997 NCE Scores: Total Language	2000 NCE Scores: Total Language	1997-2000 Gain in Total Language
Yes (Bilingual immersion students)	Non-LEP	4	Mean	78.8571	61.4286	-17.4286
			N	7	7	7
			Std. Deviation	12.3346	22.9191	20.1234
		5	Mean	65.2609	62.3913	-2.8696
			N	23	23	23
			Std. Deviation	17.0486	21.0211	19.0914
		6	Mean	62.3571	63.2143	.8571
			N	14	14	14
			Std. Deviation	21.8513	23.3508	18.0463
		7	Mean	59.6250	62.7647	1.1250
			N	16	17	16
			Std. Deviation	14.5642	18.5995	8.5313
		Total	Mean	64.6667	62.5738	-2.6333
			N	60	61	60
			Std. Deviation	17.7532	20.6207	17.3224
Yes (Bilingual immersion students)	Total (Former LEP & non-LEP)	4	Mean	78.3636	66.0000	-12.3636
			N	11	11	11
			Std. Deviation	19.2680	24.6089	21.4675
		5	Mean	63.6250	62.3750	-1.2500
			N	40	40	40
			Std. Deviation	16.3655	20.2784	16.1575
		6	Mean	59.0690	58.8276	-.2414
			N	29	29	29
			Std. Deviation	21.6827	23.6810	17.8499
		7	Mean	59.3704	59.3571	-1.3333
			N	27	28	27
			Std. Deviation	15.4226	18.8939	10.3627
		Total	Mean	62.8318	61.0093	-2.1402
			N	107	108	107
			Std. Deviation	18.6626	21.1795	16.1966

Table A-8 (continued)

	LEP Status	Grade in 2000		1997 NCE Scores: Total Language	2000 NCE Scores: Total Language	1997-2000 Gain in Total Language
Total (Immersion & Non-immersion students combined)	Former LEP	4	Mean	67.2500	63.6667	-3.2500
			N	8	9	8
			Std. Deviation	28.9667	24.5102	22.9643
		5	Mean	62.1786	60.0690	-2.7500
			N	28	29	28
			Std. Deviation	20.6309	19.6431	18.3699
		6	Mean	51.4231	49.5000	-1.9231
			N	26	26	26
			Std. Deviation	18.6723	21.2984	15.3282
		7	Mean	54.7619	52.5455	-2.2857
			N	21	22	21
			Std. Deviation	16.2016	18.5799	13.7773
		Total	Mean	57.4217	55.3256	-2.4217
			N	83	86	83
			Std. Deviation	20.3093	20.7310	16.5604
	Non-LEP	4	Mean	69.8276	60.5806	-7.2069
			N	29	31	29
			Std. Deviation	18.8851	23.9441	16.5365
		5	Mean	61.4138	58.4915	-3.2241
			N	58	59	58
			Std. Deviation	20.5042	21.6113	19.3300
		6	Mean	61.3265	59.1800	-1.8980
			N	49	50	49
			Std. Deviation	21.1033	22.0997	17.0028
		7	Mean	59.5682	62.8298	2.8864
			N	44	47	44
			Std. Deviation	15.6761	19.0484	11.2688
		Total	Mean	62.2944	60.1123	-2.0111
			N	180	187	180
			Std. Deviation	19.4846	21.4354	16.7492

Table A-8 (continued)

LEP Status	Grade in 2000		1997 NCE Scores: Total Language	2000 NCE Scores: Total Language	1997-2000 Gain in Total Language
Total (All students combined)	4	Mean	69.2703	61.2750	-6.3514
		N	37	40	37
		Std. Deviation	21.0167	23.7897	17.8313
	5	Mean	61.6628	59.0114	-3.0698
		N	86	88	86
		Std. Deviation	20.4270	20.8831	18.9158
	6	Mean	57.8933	55.8684	-1.9067
		N	75	76	75
		Std. Deviation	20.7166	22.1735	16.3370
	7	Mean	58.0154	59.5507	1.2154
		N	65	69	65
		Std. Deviation	15.8829	19.3744	12.2710
	Total	Mean	60.7567	58.6044	-2.1407
		N	263	273	263
		Std. Deviation	19.8399	21.2948	16.6593

Table A-9

Language Mean NCE Scores on the CTBS/Terra Nova in English for Students Initially Classified as LEP Compared to non-LEP Students by Program Type: Longitudinal Analyses

Attended Bilingual Immersion Program?	LEP Status		1997 NCE Scores: Total Language	2000 NCE Scores: Total Language	1997-2000 Gain in Total Language
No (Non-immersion students)	Former LEP	Mean	53.4167	50.9231	-3.6111
		N	36	39	36
		Std. Deviation	20.6597	18.5009	18.7682
	Non-LEP	Mean	61.1083	58.9206	-1.7000
		N	120	126	120
		Std. Deviation	20.2621	21.7993	16.5202
	Total	Mean	59.3333	57.0303	-2.1410
		N	156	165	156
		Std. Deviation	20.5462	21.2868	17.0212
Yes (Bilingual immersion students)	Former LEP	Mean	60.4894	58.9787	-1.5106
		N	47	47	47
		Std. Deviation	19.7064	21.9391	14.7955
	Non-LEP	Mean	64.6667	62.5738	-2.6333
		N	60	61	60
		Std. Deviation	17.7532	20.6207	17.3224
	Total	Mean	62.8318	61.0093	-2.1402
		N	107	108	107
		Std. Deviation	18.6626	21.1795	16.1966
Total (Immersion & Non-immersion students combined)	Former LEP	Mean	57.4217	55.3256	-2.4217
		N	83	86	83
		Std. Deviation	20.3093	20.7310	16.5604
	Non-LEP	Mean	62.2944	60.1123	-2.0111
		N	180	187	180
		Std. Deviation	19.4846	21.4354	16.7492
	Total	Mean	60.7567	58.6044	-2.1407
		N	263	273	263
		Std. Deviation	19.8399	21.2948	16.6593

Table A-10

Mathematics Mean NCE Scores on the CTBS/Terra Nova in English for Students Initially Classified as LEP Compared to non-LEP Students by Program Type and by Grade: Longitudinal Analyses

Attended Bilingual Immersion Program?	LEP Status	Grade in 2000		1997 NCE Scores: Total Math	2000 NCE Scores: Total Math	1997-2000 Gain in Total Math
No (Non-immersion students)	Former LEP	4	Mean	64.2500	45.0000	-17.5000
			N	4	5	4
			Std. Deviation	7.3655	16.1710	17.2143
		5	Mean	59.9091	61.4167	2.3636
			N	11	12	11
			Std. Deviation	16.0590	16.1102	13.4705
		6	Mean	45.3636	44.5455	-.8182
			N	11	11	11
			Std. Deviation	11.1828	13.7504	8.6812
		7	Mean	50.5455	53.0000	2.4545
			N	11	11	11
			Std. Deviation	10.8108	12.1491	10.1426
		Total	Mean	53.2703	52.1795	-.7027
			N	37	39	37
			Std. Deviation	13.8417	15.5578	12.7233
No (Non-immersion students)	Non-LEP	4	Mean	68.2917	63.5417	-4.7500
			N	24	24	24
			Std. Deviation	24.5489	20.9450	18.6063
		5	Mean	59.7143	51.4167	-8.3143
			N	35	36	35
			Std. Deviation	22.3298	22.3586	17.4622
		6	Mean	60.8611	60.2778	-.5833
			N	36	36	36
			Std. Deviation	20.3430	21.7750	14.1126
		7	Mean	59.3448	59.7000	.8966
			N	29	30	29
			Std. Deviation	19.8895	19.2123	11.0335
		Total	Mean	61.6210	58.2302	-3.2258
			N	124	126	124
			Std. Deviation	21.6666	21.4383	15.7252

Table A-10 (continued)

Attended Bilingual Immersion Program?	LEP Status	Grade in 2000		1997 NCE Scores: Total Math	2000 NCE Scores: Total Math	1997-2000 Gain in Total Math
No (Non-immersion students)	Total (Former LEP & non-LEP)	4	Mean	67.7143	60.3448	-6.5714
			N	28	29	28
			Std. Deviation	22.8357	21.1783	18.6675
		5	Mean	59.7609	53.9167	-5.7609
			N	46	48	46
			Std. Deviation	20.8339	21.2641	17.0856
		6	Mean	57.2340	56.5957	-.6383
			N	47	47	47
			Std. Deviation	19.6482	21.1472	12.9588
		7	Mean	56.9250	57.9024	1.3250
			N	40	41	40
			Std. Deviation	18.1608	17.7071	10.6900
		Total	Mean	59.7019	56.8000	-2.6460
			N	161	165	161
			Std. Deviation	20.4061	20.3234	15.0882
Yes (Bilingual immersion students)	Former LEP	4	Mean	65.2500	52.5000	-12.7500
			N	4	4	4
			Std. Deviation	31.9100	41.8290	13.7447
		5	Mean	60.5294	59.5882	-.9412
			N	17	17	17
			Std. Deviation	21.0033	15.8590	15.3642
		6	Mean	53.9333	52.2000	-1.7333
			N	15	15	15
			Std. Deviation	20.6863	20.2280	10.0176
		7	Mean	61.4000	51.8182	-10.2000
			N	10	11	10
			Std. Deviation	12.7819	9.0865	11.8021
		Total	Mean	58.9783	54.8085	-4.2391
			N	46	47	46
			Std. Deviation	20.1180	18.9032	13.2718

Table A-10 (continued)

Attended Bilingual Immersion Program?	LEP Status	Grade in 2000		1997 NCE Scores: Total Math	2000 NCE Scores: Total Math	1997-2000 Gain in Total Math
Yes (Bilingual immersion students)	Non-LEP	4	Mean	69.2857	63.7143	-5.5714
			N	7	7	7
			Std. Deviation	15.9135	19.4911	13.9506
		5	Mean	64.2609	66.8696	2.6087
			N	23	23	23
			Std. Deviation	17.1682	20.2019	16.9725
		6	Mean	60.2857	59.2143	-1.0714
			N	14	14	14
			Std. Deviation	19.0240	17.8764	13.6464
		7	Mean	67.4118	60.8235	-6.5882
			N	17	17	17
			Std. Deviation	22.2628	19.9663	9.7728
		Total	Mean	64.8033	63.0656	-1.7377
			N	61	61	61
			Std. Deviation	18.7917	19.3303	14.3746
Yes (Bilingual immersion students)	Total (Former LEP & non-LEP)	4	Mean	67.8182	59.6364	-8.1818
			N	11	11	11
			Std. Deviation	21.4840	28.0153	13.6588
		5	Mean	62.6750	63.7750	1.1000
			N	40	40	40
			Std. Deviation	18.7280	18.6197	16.2019
		6	Mean	57.0000	55.5862	-1.4138
			N	29	29	29
			Std. Deviation	19.8098	19.1228	11.6941
		7	Mean	65.1852	57.2857	-7.9259
			N	27	28	27
			Std. Deviation	19.2435	16.9375	10.4951
		Total	Mean	62.2991	59.4722	-2.8131
			N	107	108	107
			Std. Deviation	19.4961	19.4952	13.9027

Table A-10 (continued)

	LEP Status	Grade in 2000		1997 NCE Scores: Total Math	2000 NCE Scores: Total Math	1997-2000 Gain in Total Math
Total (Immersion & Non-immersion students combined)	Former LEP	4	Mean	64.7500	48.3333	-15.1250
			N	8	9	8
			Std. Deviation	21.4459	28.3284	14.6428
		5	Mean	60.2857	60.3448	.3571
			N	28	29	28
			Std. Deviation	18.8951	15.7009	14.4843
		6	Mean	50.3077	48.9615	-1.3462
			N	26	26	26
			Std. Deviation	17.5585	17.8784	9.3035
		7	Mean	55.7143	52.4091	-3.5714
			N	21	22	21
			Std. Deviation	12.7599	10.4865	12.4923
		Total	Mean	56.4337	53.6163	-2.6627
			N	83	86	83
			Std. Deviation	17.7305	17.4161	13.0714
	Non-LEP	4	Mean	68.5161	63.5806	-4.9355
			N	31	31	31
			Std. Deviation	22.6464	20.3056	17.4488
		5	Mean	61.5172	57.4407	-3.9828
			N	58	59	58
			Std. Deviation	20.4014	22.6771	17.9478
		6	Mean	60.7000	59.9800	-.7200
			N	50	50	50
			Std. Deviation	19.7910	20.5838	13.8462
		7	Mean	62.3261	60.1064	-1.8696
			N	46	47	46
			Std. Deviation	20.9253	19.2785	11.0928
		Total	Mean	62.6703	59.8075	-2.7351
			N	185	187	185
			Std. Deviation	20.7656	20.8465	15.2700

Table A-10 (continued)

LEP Status	Grade in 2000		1997 NCE Scores: Total Math	2000 NCE Scores: Total Math	1997-2000 Gain in Total Math
Total (All students combined)	4	Mean	67.7436	60.1500	-7.0256
		N	39	40	39
		Std. Deviation	22.1807	22.8771	17.2405
	5	Mean	61.1163	58.3977	-2.5698
		N	86	88	86
		Std. Deviation	19.8206	20.5927	16.9362
	6	Mean	57.1447	56.2105	-.9342
		N	76	76	76
		Std. Deviation	19.5780	20.2743	12.4176
	7	Mean	60.2537	57.6522	-2.4030
		N	67	69	67
		Std. Deviation	18.9059	17.2753	11.4813
	Total	Mean	60.7388	57.8571	-2.7127
		N	268	273	268
		Std. Deviation	20.0514	20.0066	14.6001

Table A-11
Mathematics Mean NCE Scores on the CTBS/Terra Nova in English for Students Initially Classified as LEP Compared to non-LEP Students by Program Type: Longitudinal Analyses

Attended Bilingual Immersion Program?	LEP Status		1997 NCE Scores: Total Math	2000 NCE Scores: Total Math	1997-2000 Gain in Total Math
No (Non-immersion students)	Former LEP	Mean	53.2703	52.1795	-.7027
		N	37	39	37
		Std. Deviation	13.8417	15.5578	12.7233
	Non-LEP	Mean	61.6210	58.2302	-3.2258
		N	124	126	124
		Std. Deviation	21.6666	21.4383	15.7252
	Total	Mean	59.7019	56.8000	-2.6460
		N	161	165	161
		Std. Deviation	20.4061	20.3234	15.0882
Yes (Bilingual immersion students)	Former LEP	Mean	58.9783	54.8085	-4.2391
		N	46	47	46
		Std. Deviation	20.1180	18.9032	13.2718
	Non-LEP	Mean	64.8033	63.0656	-1.7377
		N	61	61	61
		Std. Deviation	18.7917	19.3303	14.3746
	Total	Mean	62.2991	59.4722	-2.8131
		N	107	108	107
		Std. Deviation	19.4961	19.4952	13.9027
Total (Immersion & Non-immersion students combined)	Former LEP	Mean	56.4337	53.6163	-2.6627
		N	83	86	83
		Std. Deviation	17.7305	17.4161	13.0714
	Non-LEP	Mean	62.6703	59.8075	-2.7351
		N	185	187	185
		Std. Deviation	20.7656	20.8465	15.2700
	Total	Mean	60.7388	57.8571	-2.7127
		N	268	273	268
		Std. Deviation	20.0514	20.0066	14.6001

Table A-12
Repeated Measures ANOVAs on Total Reading Achievement by Program Experience, LEP Status, and Grade in 2000:

Tests of Within-Subjects Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Prepost	Sphericity Assumed	52.145	1	52.145	.453	.502
	Huynh-Feldt	52.145	1.000	52.145	.453	.502
Prepost by Program Experience	Sphericity Assumed	2.238E-02	1	2.238E-02	.000	.989
	Huynh-Feldt	2.238E-02	1.000	2.238E-02	.000	.989
Prepost by LEP Status	Sphericity Assumed	250.760	1	250.760	2.176	.141
	Huynh-Feldt	250.760	1.000	250.760	2.176	.141
Prepost by Grade in 2000	Sphericity Assumed	325.639	3	108.546	.942	.421
	Huynh-Feldt	325.639	3.000	108.546	.942	.421
Error (Prepost)	Sphericity Assumed	29612.751	257	115.225		
	Huynh-Feldt	29612.751	257.000	115.225		

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	1137695.035	1	1137695.035	1796.205	.000
Program Experience	4020.518	1	4020.518	6.348	.012
LEP Status	5313.450	1	5313.450	8.389	.004
Grade in 2000	1399.798	3	466.599	.737	.531
Program Experience by LEP Status	199.422	1	199.422	.315	.575
Program Experience by Grade in 2000	214.660	3	71.553	.113	.952
LEP Status by Grade in 2000	1673.710	3	557.903	.881	.452
Prog.Exp. by LEP Status by Grade in 2000	452.502	3	150.834	.238	.870
Error	162780.758	257	633.388		

Table A-13
Repeated Measures ANOVAs on Total Reading Achievement by Program Experience and LEP Status:

Tests of Within-Subjects Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Prepost	Sphericity Assumed	118.950	1	118.950	1.051	.306
	Huynh-Feldt	118.950	1.000	118.950	1.051	.306
Prepost by Program Experience	Sphericity Assumed	.145	1	.145	.001	.971
	Huynh-Feldt	.145	1.000	.145	.001	.971
Prepost by LEP Status	Sphericity Assumed	320.045	1	320.045	2.828	.094
	Huynh-Feldt	320.045	1.000	320.045	2.828	.094
Prepost by Program Experience & by LEP Status	Sphericity Assumed	.265	1	.265	.002	.961
	Huynh-Feldt	.265	1.000	.265	.002	.961
Error (Prepost)	Sphericity Assumed	30441.220	269	113.164		
	Huynh-Feldt	30441.220	269.000	113.164		

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	1362396.768	1	1362396.768	2204.498	.000
Program Experience	4174.721	1	4174.721	6.755	.010
LEP Status	5619.509	1	5619.509	9.093	.003
Program Experience by LEP Status	276.659	1	276.659	.448	.504
Error	166244.112	269	618.008		

Table A-14
Repeated Measures ANOVAs on Total Language Achievement by Program Experience, LEP Status, and Grade in 2000:

Tests of Within-Subjects Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Prepost	Sphericity Assumed	766.004	1	766.004	5.500	.020
	Huynh-Feldt	766.004	1.000	766.004	5.500	.020
Prepost by Program Experience	Sphericity Assumed	16.147	1	16.147	.116	.734
	Huynh-Feldt	16.147	1.000	16.147	.116	.734
Prepost by LEP Status	Sphericity Assumed	2.023	1	2.023	.015	.904
	Huynh-Feldt	2.023	1.000	2.023	.015	.904
Prepost by Grade in 2000	Sphericity Assumed	488.855	3	162.952	1.170	.322
	Huynh-Feldt	488.855	3.000	162.952	1.170	.322
Error (Prepost)	Sphericity Assumed	34402.327	247	139.281		
	Huynh-Feldt	34402.327	247.000	139.281		

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	1260837.644	1	1260837.644	1830.713	.000
Program Experience	4099.774	1	4099.774	5.953	.015
LEP Status	2378.069	1	2378.069	3.453	.064
Grade in 2000	5031.912	3	1677.304	2.435	.065
Program Experience by LEP Status	987.828	1	987.828	1.434	.232
Program Experience by Grade in 2000	1000.702	3	333.567	.484	.693
LEP Status by Grade in 2000	2471.278	3	823.759	1.196	.312
Prog.Exp. By LEP Status by Grade in 2000	1132.081	3	377.360	.548	.650
Error	170112.334	247	688.714		

Table A-15
Repeated Measures ANOVAs on Total Language Achievement by Program Experience and LEP Status:

Tests of Within-Subjects Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Prepost	Sphericity Assumed	603.601	1	603.601	4.308	.039
	Huynh-Feldt	603.601	1.000	603.601	4.308	.039
Prepost by Program Experience	Sphericity Assumed	9.197	1	9.197	.066	.798
	Huynh-Feldt	9.197	1.000	9.197	.066	.798
Prepost by LEP Status	Sphericity Assumed	4.197	1	4.197	.030	.863
	Huynh-Feldt	4.197	1.000	4.197	.030	.863
Prepost by Program Experience & by LEP Status	Sphericity Assumed	62.143	1	62.143	.444	.506
	Huynh-Feldt	62.143	1.000	62.143	.444	.506
Error (Prepost)	Sphericity Assumed	36289.717	259	140.115		
	Huynh-Feldt	36289.717	259.000	140.115		

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	1490881.319	1	1490881.319	2161.578	.000
Program Experience	3396.618	1	3396.618	4.925	.027
LEP Status	4061.491	1	4061.491	5.889	.016
Program Experience by LEP Status	683.650	1	683.650	.991	.320
Error	178637.246	259	689.719		

Table A-16
Repeated Measures ANOVAs on Total Mathematics Achievement by Program Experience, LEP Status, and Grade in 2000:

Tests of Within-Subjects Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Prepost	Sphericity Assumed	1349.405	1	1349.405	13.167	.000
	Huynh-Feldt	1349.405	1.000	1349.405	13.167	.000
Prepost by Program Experience	Sphericity Assumed	34.518	1	34.518	.337	.562
	Huynh-Feldt	34.518	1.000	34.518	.337	.562
Prepost by LEP Status	Sphericity Assumed	85.710	1	85.710	.836	.361
	Huynh-Feldt	85.710	1.000	85.710	.836	.361
Prepost by Grade in 2000	Sphericity Assumed	839.854	3	279.951	2.732	.044
	Huynh-Feldt	839.854	3.000	279.951	2.732	.044
Error (Prepost)	Sphericity Assumed	25825.927	252	102.484		
	Huynh-Feldt	25825.927	252.000	102.484		

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	1219439.532	1	1219439.532	1773.836	.000
Program Experience	1168.487	1	1168.487	1.700	.194
LEP Status	4356.908	1	4356.908	6.338	.012
Grade in 2000	3011.811	3	1003.937	1.460	.226
Program Experience by LEP Status	1.084	1	1.084	.002	.968
Program Experience by Grade in 2000	65.082	3	21.694	.032	.992
LEP Status by Grade in 2000	2330.767	3	776.922	1.130	.337
Prog.Exp. By LEP Status by Grade in 2000	1727.965	3	575.988	.838	.474
Error	173239.652	252	687.459		

Table A-17
Repeated Measures ANOVAs on Total Mathematics Achievement by Program Experience and LEP Status:

Tests of Within-Subjects Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Prepost	Sphericity Assumed	669.970	1	669.970	6.253	.013
	Huynh-Feldt	669.970	1.000	669.970	6.253	.013
Prepost by Program Experience	Sphericity Assumed	28.649	1	28.649	.267	.606
	Huynh-Feldt	28.649	1.000	28.649	.267	.606
Prepost by LEP Status	Sphericity Assumed	3.209E-03	1	3.209E-03	.000	.996
	Huynh-Feldt	3.209E-03	1.000	3.209E-03	.000	.996
Prepost by Program Experience & by LEP Status	Sphericity Assumed	172.388	1	172.388	1.609	.206
	Huynh-Feldt	172.388	1.000	172.388	1.609	.206
Error (Prepost)	Sphericity Assumed	28283.790	264	107.136		
	Huynh-Feldt	28283.790	264.000	107.136		

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	1491997.185	1	1491997.185	2178.596	.000
Program Experience	1690.048	1	1690.048	2.468	.117
LEP Status	5480.263	1	5480.263	8.002	.005
Program Experience by LEP Status	4.915E-03	1	4.915E-03	.000	.998
Error	180798.636	264	684.843		

Table A-18
Stepwise Regression Analyses: Effects of Socioeconomic Status and Years in Program on Former LEP Students' Reading Achievement in 2000

Model Summary

	R	R Square	Standard Error of the Estimate	Change Statistics				
Model				R Square Change	F Change	df1	df2	Sig. F Change
Socioeconomic Status 1	.249	.062	16.77	.062	5.744	1	87	.019
Years in Bilingual Classes 2	.350	.122	16.32	.060	5.915	1	86	.017

Model Summary

	R	R Square	Standard Error of the Estimate	Change Statistics				
Model				R Square Change	F Change	df1	df2	Sig. F Change
Years in Bilingual Classes 1	.291	.085	16.57	.085	8.062	1	87	.006
Socioeconomic Status 2	.350	.122	16.32	.037	3.673	1	86	.059

Findings from a Large Urban Research Site in the South-Central U.S.

The Regional Social Context

The states in the southwest U.S. from Texas to southern California are historically strongly linked with Mexico. This territory was owned by Spain and then Mexico as recently as 150 years ago. The Hispanic heritage of these states remains strong, and the peoples of Hispanic descent are numerous, including various regions of these states where Hispanics are the majority of the population. Some of these Hispanics are full-blooded Indians, descendants of the ancient peoples who populated these lands before the arrival of the Europeans, including many diverse Indian groups with distinct languages and cultures, who added Spanish to their language repertoire during the Spanish-Mexican period of domination. Others are descended from the first Spaniards to arrive in the 1500s and 1600s. The large majority are of mixed Indian and Spanish heritage. The U.S. government uses the term Mexican-American to refer to all these groups of peoples. In this report, we will use the term Mexican-American when referring to those of Mexican heritage, and we will use the term Hispanic-American when referring to groups that include U.S.-born and immigrant groups arriving from Mexico as well as Central and South America.

The four states along the Mexico-U.S. border — California, Arizona, New Mexico, and Texas — have carried out varying policies when addressing the needs of their Mexican-descent populations. As the populations of European descent have increased in each of these states, they have continued to tolerate some form of recognition of their culturally and linguistically diverse heritages. But tensions have arisen between groups as the numbers of immigrants coming from Mexico and Central America have greatly increased over the past three decades. This has led to the development of the English-only movement, which has made some strong inroads with the voter passage of Proposition 227 in California and Proposition 203 in Arizona. These referenda limit the use of any languages other than English for schooling students of diverse linguistic heritages. Thus the states of New Mexico and Texas have experienced some increased social pressure to revisit issues related to bilingualism.

Notably, New Mexico is the only official bilingual state in the U.S. The two languages Spanish and English are legally accepted, although some English-only challenges have occasionally been brought to local schools. Spanish-English bilingual education is provided by most of the large city school systems in New Mexico, for schooling some of their students of Mexican descent, and a few two-way bilingual schools flourish, providing bilingual schooling for all whose parents choose for their children to attend.

The Social Context Within the State

Texas, the second largest state in the U.S. and known for its independent ways of conducting business, has developed its own unique response to its Hispanic heritage. Tolerance of bilingualism is the general social response to Hispanics in Texas. Some Texas communities respond even more positively, with not just tolerance but celebration of their diverse heritages, through local government services that acknowledge the region's diversity, and businesses that pay higher salaries to their bilingual staff, for assisting them with commerce that crosses the two countries' borders.

Texas state legislation. To make sure that children who do not yet speak English when they enroll in Texas schools receive "meaningful" schooling as required by *Lau v. Nichols (1974)*, the Texas legislature passed a bill in the 1970s requiring bilingual education for these children for Grades K-3. This provision was later extended to Grades PK-5. According to this state legislation, each school district with an enrollment of 20 or more students of limited English proficiency of one language background in the same grade level is expected to offer bilingual schooling to these students. This is one of the stronger pieces of state legislation providing for equality of educational opportunity through public bilingual schooling, supporting transitional bilingual education for all of the elementary school years.

In May 2001, new Texas state legislation was passed unanimously by the House and Senate which strongly supports the development of more dual language programs for students in Texas. In the Senate concurrent resolution which preceded the bill, the focus was on preparing Texas citizens for economic competitiveness in the international arena and capitalizing on the cultural and linguistic richness that exists in the state:

> ... WHEREAS, The State of Texas has well-established bilingual programs already in the public education system; and
>
> WHEREAS, Dual language bilingual programs integrate native English speakers and language-minority students for academic instruction; and
>
> WHEREAS, Dual language bilingual programs create an additive bilingual environment for all students in which the first language is maintained while the second language is acquired; and
>
> WHEREAS, Dual language bilingual programs promote bilingual proficiency, cross-cultural awareness, and high academic achievement in all students; and
>
> WHEREAS, Dual language bilingual programs will prepare our students academically and linguistically to be multi-literate citizens in an international community as they master "English-Plus" another language; and
>
> WHEREAS, The workforce of tomorrow must meet the demands of a global economy; now therefore be it
>
> RESOLVED, That the 77th Legislature of the State of Texas hereby encourages school districts to develop and implement dual language bilingual programs in which students may participate throughout their education; and, be it further
>
> RESOLVED, That the State of Texas work toward the worthy goal of ensuring that some day every Texas student will master "English-Plus" another language....
> (Texas Senate Concurrent Resolution Number 50, 2001)

This piece of state legislation makes an even stronger statement to commit state resources to expand and maintain bilingualism among all citizens, for the future economic benefit of the state of Texas.

Status of Spanish and local language varieties. Given that Spanish is the most widely spoken minority language of the state of Texas, the state legislation that has been passed supporting dual language schooling has strong implications for development of the Spanish language in the region. Spanish is considered a high-status language, as the third largest world language, the official language of 20 countries (Baker & Prys Jones, 1998). But the regional varieties of Spanish present among the Spanish-speaking population throughout the southwest U.S. are not considered prestigious varieties. The lower status afforded the border dialects is similar to the experience of the French-speaking residents of northern Maine, who have in the recent past viewed their language as a "street language," not to be taught in public schools. The language restoration taking place in northern Maine schools assists students with understanding bidialectal differences and valuing both their native variety and the standard varieties of French. A parallel process is taking place in the southwest region, where bilingual schools have assisted students to value and acknowledge their regional Spanish vocabulary and other features of local language, and at the same time acquire the written standard Spanish that has high status around the world.

Heritage language and culture restoration for purposes of economic development. The Texas context also has parallels with northern Maine in regard to the emphasis in the state legislation on development of English plus other languages for the sake of the economy of Texas. Recognizing that "economic competitiveness is enhanced if citizens are fluent in both English and another language" and that "a global economy necessitates knowledge of the cultures and customs of others," the state legislation encourages schools to develop dual language programs to "capitalize on the cultural richness that [the state's] diversity provides" (Texas Senate

Concurrent Resolution Number 50, 2001). This type of thinking is prevalent among many business leaders in the state. With the North American Free Trade Agreement now in place, the exchange of goods, services, and resources across the Mexican-U.S. border is increasing rapidly. Whereas economic interaction was largely with the English-speaking U.S. in past years, the need for proficient Spanish-English bilingual personnel across all sectors of the Texas economy is suddenly emerging. Adults who were punished for speaking Spanish at school are now being encouraged to enroll their children in programs to develop their standard Spanish as well as English skills. Goals of bilingual programs also include the enhancing of self-esteem among Hispanic students, who in earlier decades perceived their language and culture as lower in status, not respected and valued by the broader community.

These regional changes will take time. English is clearly the power, high status language and is in no danger of replacement. But Texas planners are thinking ahead to the future in these moves towards a broadened perception of the value of bilingualism/biculturalism for economic as well as educational reasons.

The School District Site

Texas is the location for one of our large urban school district sites. We have chosen Houston Independent School District as one of the sites for this research report, because of the staff's strong commitment to change efforts to appropriately serve their large culturally and linguistically diverse school population and their willingness to make school policy decisions based on their student achievement outcomes. The decisions this school system has made for schooling language minority students provide a mirror for viewing the needs and concerns of other school districts in the state of Texas, as well as for neighboring states.

Houston Independent School District is the fifth largest school district in the United States and the largest school district in the state of Texas. As of the school year 1999-2000, there were

210,547 students enrolled in this large urban school system which is 54 percent Hispanic, 33 percent African-American, 10 percent Euro-American, 2.9 percent Asian, and 0.1 percent Native American. Students on free or reduced lunch were 75.4 percent of the total student enrollment in the city. Students classified as limited in English proficiency represented 28 percent of the total, and 96 percent of these English language learners were on free and reduced lunch in 1999-2000. Newly arrived immigrants enrolling in Grades K-12 were only 5.4 percent of the total student enrollment. Thus the large majority of language minority students served by Houston's schools were born in the U.S. or arrived sometime between birth and age four, representing 51.4 percent of the total student population.

Hispanics are the fastest growing group in the school district. One decade ago in 1990-91, Hispanics were 44.8 percent of the school population, whereas ten years later they are now at 54 percent. Hispanics enrolled in the Houston schools who were born outside the U.S. come mostly from Mexico, El Salvador, Honduras, Guatemala, and Nicaragua. Asians increased in number only slightly during the same decade, from 2.7 percent to 2.9 percent. Asian immigrant arrivals have come mostly from Vietnam, Pakistan, or China. These two categories — Hispanic and Asian — represent the language minority population of Houston schools, at 56.9 percent in 1999-2000. During the same decade, African-Americans dropped in number from 38 percent to 33 percent of the total school enrollment, and Euro-Americans decreased in number from 14.3 percent to 10 percent.

Since language minority students are now the majority (56.9 percent) and those who are limited-English-proficient represent 28 percent of the total enrollment as well as half of all language minority students, the Houston city schools' challenge has been to create quality programs that enhance the academic performance of language minority students, who typically score, nationwide, at the 10th- 12th percentile on norm-referenced tests in the 11th grade, as we have seen in the data from many school districts in all regions of the U.S. (Thomas & Collier, 1997, 2001).

The challenge is still greater when considering that 75.4 percent of all students in this urban school district are of low income background, as measured by free and reduced-price lunch, and there is considerable student mobility, from school to school, as well as in and out of the district.

The "at risk" factors present among this school population would lead to the prediction that this school district would be among the lowest-achieving school systems in the country. But it is not. Student achievement on the Stanford 9 (a national norm-referenced measure), as well as the Texas Assessment of Academic Skills (the state's standardized measure) is high for the student populations it serves and is improving every year. We shall examine in this report some of these patterns in the Houston student achievement data. First, let us survey the range of programs provided for language minority students in the school system, and some of the overall program characteristics.

Houston's Programs for Language Minority Students

The Multilingual Programs Department designs the overall program plans for limited-English-proficient and language minority students and provides staff development support and resources to implement the programs. The program choices include quite a range of services to assist the students. In this summary, we must necessarily be brief with this overview of program characteristics.

Overall, the mission statement, beliefs, and goals for Multilingual Programs, that were approved by the Houston school board in July 1999, emphasize the importance of high academic achievement, English language proficiency development, and opportunities for all students to graduate proficient in two languages (English plus another). The final core belief states: "Increasingly, Houston Independent School District should offer opportunities for all students to acquire two languages to excel in a competitive global marketplace." To accomplish this core belief, the accompanying goal states, "Expansion of the two-way and developmental bilingual programs shall be encouraged ... and support for [these] existing programs is also essential" (Bilingual/ESL Program Guidelines, January, 2001).

State program mandates. Since all elementary schools in Houston are required by state law to offer a bilingual program for limited-English-proficient (LEP) students in Grades PK-5 whose home language is spoken by 20 or more students in any single grade in the entire school district, the large majority of elementary schools provide at least transitional bilingual education for Spanish-speaking LEP students. In 1996, Vietnamese bilingual classes were added for the next largest language group (1,118 Vietnamese speakers, compared to 52,156 Spanish speakers, in 1995, the planning year for the Vietnamese program). By 1998, 23.4 percent of the students in the Houston school system were attending enrichment or transitional bilingual classes. In 2001, Chinese, Arabic, and Urdu speakers may be of sufficient number to provide some academic work taught through these languages.

For speakers of other languages where the numbers are less than 20 in one grade level across the district, elementary schools are required by state law to offer alternative language support programs, such as English as a Second Language (ESL). The Houston school system provides an ESL Content program for these students, and ESL Content teaching is an important component of all bilingual programs in the school system. All secondary schools are required by state law to offer ESL Content and Sheltered Content programs for their LEP students in post-elementary through secondary grades. As of 1998-99, 12.1 percent of the students in Houston were attending ESL content classes with no additional native language support. In all, 35.5 percent of the total student enrollment of Houston attended bilingual and/or ESL classes in 1998-99. Bilingual programs are offered in some middle and high schools where resources are available, especially those schools serving as feeder schools for the strongest bilingual programs, described in the next paragraphs.

Enrichment bilingual education. Two additional bilingual program models are available as choices for parents in the Houston school system. In 1997 these two programs, Two-way Bilingual Immersion and Developmental Bilingual Education, received strong backing from Dr. Rod Paige, then Superintendent of the Houston school system. He became convinced that the research strongly supports enrichment forms of bilingual education, and he wanted all schools in Houston to work on enhanced models of bilingual instruction that lead to very high academic achievement. During the Spring of 1997, the Multilingual Programs staff refined and added greater specificity to their existing bilingual program model descriptions, to ensure that the programs offered were exemplary models based on current research findings and to ensure greater consistency and continuity throughout the district's 198 elementary schools, given high student mobility rates from school to school within the system.

Two-way Bilingual Immersion. The Two-way Bilingual Immersion program (including native English speakers) was begun in 1992 at one school, Herod Elementary, as a 50-50 model, and was converted to a 90-10 model by 1997. The second school to implement this program was Cunningham Elementary in 1995, also converting to a 90-10 model by 1997. By 1996, the program was in place in 7 elementary schools. As of August 2001, there are now 11 two-way bilingual 90-10 schools in Houston Independent School District. Each school started the initial year of the two-way program in Grades K-1, adding one grade level with each additional school year. The highest grade levels of implementation of this program are those of the bilingual students from Herod and Cunningham who are now attending the feeder middle school, Johnston, having reached Grades 6 and 7 in the Fall of 2001. In this report, student achievement data on this program will be presented through Grade 5 (Year 2000). Several of these schools are over 90 percent students of low-income background.

Developmental Bilingual Programs. The second type of enrichment bilingual program provided in Houston is Developmental Bilingual Education, designed for Spanish-speaking students. These are one-way dual-language classes (one language group receiving their schooling through two languages), providing strong grade-level schooling in Spanish throughout the elementary school years, and gradually increasing the amount of instruction in English with each year until 50 percent of the content instruction is in English, by fourth grade. As of August, 2001, there are 22 elementary and two middle schools providing developmental bilingual education for their Spanish-speaking students. To date, student achievement data has been collected on this model from 1997 to 2000, and we will present these analyses in the next major section of this report.

Balance of the two languages of instruction. The three types of bilingual program models in Houston schools — Transitional Bilingual, Developmental Bilingual, and Two-way Bilingual Immersion — were purposely designed to be identical in Grades PK-3 to ensure greater program continuity for students moving from school to school within the district. In the early grades, instruction starts with 90 percent of the day in Spanish and 10 percent in English. The amount of English instruction is increased each year until fourth grade, at which time students in Transitional Bilingual are moving towards the goal of all-English instruction while students in both Developmental Bilingual and Two-way Bilingual Immersion are moving into half a day in each language. The goal in the Transitional Bilingual Program is to mainstream students into the all-English curriculum; whereas the goal in both the Developmental Bilingual Program and the Two-way Bilingual Immersion Program is to promote bilingualism and biliteracy, reaching a level of proficiency in both languages that leads to a 50 percent native language curriculum and 50 percent English curriculum by Grades 4 and 5. In the program guidelines, the 50-50 ratio of instruction provided in each language will continue throughout middle and high school, with half of the subjects of instruction in English and half in Spanish. Three feeder middle schools to date have implemented this model, as the students who have received these programs in elementary school reach their secondary years of schooling.

In the two enrichment bilingual models, initially almost all grade-level content instruction is in Spanish (or Vietnamese). As English increases in the percentage of instructional time, more content is introduced through English. Language of instruction alternates by subject, sometimes taught through thematic units. By fourth grade, mathematics and Spanish language arts (including reading and writing) are taught in Spanish; and science, social studies and literature are taught in English. In fifth grade, science, social studies and literature are taught in Spanish; while mathematics and English language arts (including reading and writing) are taught in English. Special or ancillary subjects are taught in English (e.g. physical education, music, art, library, computer lab), although the eventual goal of the school system is to provide more of these specials in Spanish too.

Bilingual teachers are strongly advised not to translate or code-switch between the two languages, but to adhere to the strict rule that instruction in Spanish is never combined with instruction in English. Following the research findings that separating the two instructional languages leads to deeper proficiency development in each language, teachers confirm that this classroom practice leads to stronger English and Spanish development. Furthermore, in the Two-way Bilingual Immersion model, students are integrated for all instruction — native-English speakers with native-Spanish speakers, except in kindergarten and first grade, when they are separated for the English language development time. By Grade 2, they are schooled together all day and serve as peer tutors for each other as each group acquires the other language of instruction.

Teacher credentials and teaching practice. In 1999-2000, 18.6 percent of the 11,674 teachers in the Houston school district were bilingual/ESL teachers. Over 90 percent of the schools provided some form of bilingual or ESL services to language minority students. Teachers' ethnicity was somewhat representative of the student population, although not nearly enough Hispanic teachers have been hired by the system. African-American teachers are the largest in number at 43.5 percent, Euro-American teachers 38 percent, Hispanic teachers 16.6 percent, and

Asian teachers 1.8 percent. Thirty percent of the teachers in the system have masters degrees and 64 percent have bachelors degrees, and 1.4 percent have completed the doctoral degree. Half of the teachers have over ten years of teaching experience; 37 percent have five years or less of teaching experience. Only one percent of the bilingual/ESL teachers in a given year may not be certified when initially hired but they take coursework and receive their teaching credentials during the first year of teaching.

Over 40 staff development courses and workshops are offered each year for bilingual/ESL teachers. The central school district office staff do not monitor teachers' implementation practices, except at the building level by administrative staff. General descriptions of teaching practices include use of cooperative learning, visuals and manipulatives, whole language combined with balanced literacy instruction, literature-rich approaches to reading and writing (although some individual schools have chosen "packaged" approaches such as Success for All), multicultural literature, integrating content and language instruction through thematic units, emphasis on cognitive development and developmentally appropriate practices, and incorporation of students' bilingual/bicultural knowledge into the curriculum.

Generally, most of the bilingual classes are taught by one teacher who provides instruction in both English and Spanish, with the languages separated by subject taught. However, team-teaching is practiced in some of the Two-way Bilingual Immersion schools and the Developmental Bilingual schools, with each teacher representing one language of instruction.

Results in Student Academic Achievement

First, we present overall results from the school district reports of student achievement data as of 1999, analyzed by our collaborative researchers within the school system who are staff members of the Research and Accountability Department of Houston Independent School District. In the sections that follow this first section, we will then present our own analyses of the student achievement data, focusing in on the two highest-achieving programs in the school district to date, the Two-way Bilingual Immersion Program and the Developmental Bilingual Program.

Comparisons of native-English speakers and former LEP students. The first cross-sectional analyses demonstrate the English achievement levels of four groups of students in Houston schools district-wide, as measured by the Stanford 9 Reading and Math tests, in normal curve equivalents (NCEs). As can be seen in Figure C-1 and Table C-1, native-English speaking students in Houston clustered around the 50th NCE (which is equivalent to the 50th percentile) or slightly below on the total reading subtest of the Stanford 9, for all Grades 2-11. This is excellent achievement for a large mostly low-income school district.

Hispanic students who were graduates of the transitional bilingual education program (and former LEP students), when they were first tested in English on the Stanford 9 reading measure at fourth grade scored slightly above the native-English speakers. By sixth grade, the Hispanic students scored at the 54th NCE (57th percentile), 6 NCEs higher in English achievement than their native-English-speaking counterparts, which is a moderately significant difference in terms of effect size, based on a national standard deviation of 21.06 NCEs. For Grades 7-9, the Hispanic graduates of transitional bilingual education achieved slightly higher or at the same level as native-English speakers, and they were slightly but not significantly below the native-English speakers in their tenth and eleventh grade scores. The Hispanic graduates of bilingual classes are thus maintaining their relatively high level of English achievement throughout their schooling, an unusual finding for former English language learners in general (Thomas & Collier, 1997).

English language learners who received all of their schooling through English, initially enrolling in the ESL content program, also fared quite well, until they reached the high school years. As seen in Figure C-2 and Table C-1, initially, when first tested on the Stanford 9 in fourth grade, they outscored the bilingually schooled students, at the 57th NCE (63rd percentile) and reaching the

59th NCE (66th percentile) in fifth grade. Then they scored equally with the bilingually schooled students through eighth grade. But beginning in ninth grade, their scores began to drop, and they reached only the 40th NCE (31st percentile) by eleventh grade. At the end of schooling, the seven-NCE higher achievement of the bilingually schooled former LEPs, in comparison to the graduates of the ESL content program, is a very significant difference in terms of effect size — what is termed by program evaluators an "actionable" difference, equivalent to one-third of a national standard deviation. We have seen this pattern in many other data sets for other school districts. Generally, bilingually schooled students outperform students schooled only through English, but the significant differences do not show up until the secondary years of schooling.

The biggest shock is the achievement levels of those students who were not proficient in English upon enrollment in the Houston schools whose parents signed a waiver requesting that their children be placed in the mainstream, with no bilingual or ESL support. As seen in Figure C-1 and Table C-1, these students were doing very well when first tested, at the 49th NCE (49th percentile) on the Stanford 9 reading test in second grade. Their scores lowered to the 45th NCE (40th percentile) by third grade and continued to go down throughout their schooling, reaching the 22nd NCE (9th percentile) in tenth grade and the 25th NCE (12th percentile) in eleventh grade. This is a very large and significant difference in achievement, 22 NCEs lower than the graduates of bilingual classes, and 15 NCEs lower than the graduates of ESL content classes. This is an important finding for parents, and illustrates the academic benefits of students receiving bilingual/ESL services. This finding also illustrates the wisdom of *Lau v. Nichols* (1974), the U.S. Supreme Court decision requiring that students not yet proficient in English receive a "meaningful education." The Court further ruled that submersing these students in the mainstream with no extra support is not considered a meaningful education. The cost of doing nothing for LEP students, as seen in this research finding, is dramatic underachievement.

In math achievement, presented in Table C-2, the same general patterns are present as those of the reading achievement measure. Native-English speakers scored higher in math than in reading during the elementary school years, reaching the 56th NCE (61st percentile) by the end of fifth grade. Bilingually schooled students as well as ESL graduates scored even higher at the 66th NCE (77th percentile) in fourth grade and by seventh grade both of these groups were doing better than the native-English speakers. By eighth grade the three groups were relatively comparable in math achievement, slightly below the 50th NCE. However, in Grades 10 and 11, there was a dropoff in the ESL graduates' math performance, causing them to finish at the 41st NCE (33rd percentile), while the bilingual graduates finished at the 44th NCE (39th percentile) in eleventh grade. Once again, the LEP students whose parents chose not to have their children attend bilingual/ESL classes started out doing well in second and third grade, but their scores went steadily down so that at eleventh grade they finished at the 34th NCE (22nd percentile).

Figures C-3 and C-4 and Table C-3 illustrate the very high achievement of Spanish-speaking students in Spanish, as measured by the Aprenda 2 (a norm-referenced test in Spanish comparable to the Stanford 9), for the grades tested (1-8). For Grades 1-5 on the reading test, the Hispanic students were consistently outscoring the native-English speakers when tested in their native language, including at especially high levels in the early grades (when the most first language support is provided) — ranging from 7 to 13 NCEs higher than the English reading scores of native-English speakers on the Stanford 9. The Spanish speakers' eighth grade performance on the reading test at the 64th NCE (75th percentile) is dramatically high, especially given the cognitive demand of this middle school test. Likewise, both groups have done well in math achievement, expressed in both languages, staying at, above, or slightly below the 50th percentile. These analyses of Stanford 9 and Aprenda 2 results demonstrate that Hispanic students are staying on or close to grade level in both languages, and if continuing instruction is provided in both Spanish and English, the large majority will graduate proficiently bilingual, meeting a major goal of the school system.

Dropout, attendance, and retention rates. Included in the analyses of our collaborators in the Research and Accountability Department are additional measures of academic achievement — dropout, attendance, and retention data, for four groups — native-English speakers, LEP students currently attending bilingual/ESL education, former LEP students who received bilingual/ESL services, and former LEP students who did not receive bilingual/ESL services. The group with the lowest academic achievement (as seen in Figure C-1 and Tables C-1 and C-2) — former LEP students whose parents refused bilingual/ESL services — also had the highest dropout rate (4.6 percent), the highest retention rate (13.9 percent — meaning that they were retained in the same grade for two years), and the lowest attendance rate (93.5 percent). Former LEP students who did receive bilingual/ESL support in the elementary school grades demonstrated their higher commitment to schooling on these three measures, with the lowest dropout rate (1.5 percent), lowest retention rate (9 percent), and highest attendance rate (96.8 percent) of any group in the school district. LEP students currently attending bilingual/ESL programs also attended school more (96.2 percent) than mainstream native-English speakers (93.6 percent), with these two groups comparable on dropout rates (both at 3 percent), and retention rate lower among native-English speakers (10.3 percent) compared to current LEP students (11.5 percent). Once again, the group most at risk consists of former LEP students who received no bilingual/ESL support. The group of students who attend school more, are retained in grade less, and drop out less are the graduates of bilingual/ESL education.

Student Achievement: Comparisons by Bilingual Program Type

In this section, we are presenting the results of our own data analyses, focusing on variations between different types of bilingual programs provided for students in the Houston school district. Since it is very evident in the district-wide data that bilingually schooled students outperform monolingually schooled students, the next step we took in examining the Houston data was to analyze what variations make a difference among the various types of bilingual services. We have examined these bilingual program variations through both cross-sectional and quasi-longitudinal analyses.

The data analyses include all students who were schooled bilingually for 1-5 years (1996-2000) in one of three program types — transitional bilingual education, developmental bilingual education (a one-way program for one language group, in this case Spanish speakers), and two-way bilingual immersion (a two-way program for two language groups, in this case Spanish and English speakers). These three programs are described in detail in the sections above on Houston's programs for language minority students. All three programs follow the same ratio of Spanish-English instruction for Grades PK-3, with a higher proportion of Spanish in the early years (PK-2), increasing the amount of English instruction during Grade 3. Thus the programs are not significantly different, by the instructional language used, until Grade 4. By this grade, students in transitional bilingual education are transitioning into all-English instruction; whereas students in the other two models receive half a day of instruction in each language, throughout the remainder of their elementary school years (with the plan to continue this 50-50 ratio in secondary school). By the end of this study, the highest grade that students have reached in the developmental bilingual and two-way bilingual immersion schools is fifth grade. Future studies will continue to examine these students' progress as they move on through the secondary grades.

The other major difference between the two-way bilingual schools and the other two bilingual models in Houston is the inclusion of native-English speakers in the two-way bilingual classes. The research to date has found that interacting with same-age native-speaking peers assists the natural second language acquisition process and creates an additive bilingual context, with a positive social and emotional climate for all. Thus both language groups are peer teachers for each other. However, since Houston schools are only 10 percent Euro-American and 33 percent African-American, and these two native-English-speaking groups are not represented in every school, most of the two-way bilingual schools do not have the "research ideal" of 50 percent native-English speakers in each bilingual classroom. Thus the one-way and two-way bilingual programs in this particular school system are more alike than different, in contrast to two-way schools in other cities that have the natural demographics to create closer to a 50-50 ratio among the two student groups.

Spanish achievement. Figures C-5, C-6, and C-7 and Table C-4 present the cross-sectional analyses and Tables C-5 and C-6 present the quasi-longitudinal analyses for comparing these three bilingual program types on the Aprenda 2 reading, math, and language tests, administered to the students in Spring, 2000. Cross-sectional analyses examine different students at each grade level, while longitudinal analyses follow the same groups of students across time. These are quasi-longitudinal data views, in that they are examining the same groups of students followed across time (e.g. those with one year of bilingual schooling, those with two years, etc., up to five years) but who had no pretest administered at the beginning of the program. A true longitudinal analysis would start with a pretest measure, which was not available for this study.

Comparison groups attending transitional bilingual education (TBE) programs were chosen for these analyses, to compare to the performance of the LEP students in the developmental (DBE) and two-way (TWBI) bilingual schools. These comparison groups were chosen by matching schools that had comparable proportions of LEP students in the two categories of socioeconomic status (free & reduced lunch versus paid lunch), and by proximity, meaning that the two schools being compared served the same neighborhood of the city. Each set of scores presented in Tables C-4 through C-9 has four comparisons. First is the TBE comparison group (labeled non-DBE) matched with the DBE group. Second is the DBE group. Third is the TBE comparison group (labeled non-TWBI) matched with the TWBI group. Fourth is the TWBI group. In addition, Table C-4 includes a fifth group — native-English speakers attending TWBI. They are placed in this table between the non-TWBI comparison group and the TWBI LEP group.

To summarize all of these groups' achievement in Spanish, it is dramatically high and above the

50th percentile by statistically and practically significant amounts. All groups are above grade level performance on reading, math, and language, except for math achievement of the LEP first graders who had only received one or two years of schooling to date. However, the first graders who had received three years of schooling (PK-1) are at or above the 50th NCE. All groups remain at or above the 50th percentile/NCE through fifth grade, the last year of test data available for this report. Overall, both the Developmental Bilingual Education students and the Two-way Bilingual Immersion students outscore their comparison groups and the TWBI students outscore the DBE students on reading, math, and language in Spanish. In the cross-sectional analyses (Figures C-5, C-6, C-7, and Table C-4), by Grade 5, the LEP students attending two-way bilingual schools are at the 61st NCE (70th percentile) in reading and language and the 59th NCE (67th percentile) in math; while the LEP students attending developmental bilingual schools are at the 55th NCE (60th percentile) in reading and the 57th NCE (63rd percentile) in math and language. Their comparison LEP groups attending transitional bilingual classes are scoring in fifth grade at the 53rd and 50th NCEs in reading, 54th and 56th NCEs in math, and 54th and 53rd NCEs in language (ranging from the 50th to the 61st percentile).

Tables C-5 and C-6 illustrate the same patterns of achievement in Spanish, presented first by number of years in the program (Table C-5) and second broken down by both grade and number of years in the program (Table C-6). Among all groups, their performance is at or above grade level. But in overall achievement, the TWBI students outscore the DBE students in subjects taught in Spanish by 2-6 NCEs, and both of these groups outscore the TBE students — the TWBI students by 3-11 NCEs (a very significant amount) and the DBE students by 2-3 NCEs.

Furthermore, the native-English speakers in the two-way bilingual classes are benefitting greatly from this bilingual schooling. As seen in Table C-4, and later in Table C-12, native-English speakers' performance in Spanish increased at each subsequent grade level. Generally, these students have attended the program since kindergarten, so after three years of Spanish academic development, by the end of the second grade when they were first tested on this norm-referenced test in Spanish, they consistently scored above grade level in Spanish — at the 59th NCE (67th percentile) in reading, the 51st NCE (51st percentile) in math, and the 55th NCE (60th percentile) in language. With each additional year of bilingual schooling, they increased their achievement in Spanish until in fifth grade, they reached the 74th NCE (87th percentile) in reading, the 70th NCE (83rd percentile) in math, and the 68th NCE (80th percentile) in language. However, it must be pointed out that the number of native-English speakers with test data was very small in the first years of the program, so that as the number of these students increases, these high achievement levels will likely decrease to a more normal level of achievement, perhaps more comparable to that of the Spanish speakers, whose test scores are more reliable because of the greater number of students tested.

English achievement. Figures C-8, C-9, C-10, and present the cross-sectional analyses, and Table C-8 presents the quasi-longitudinal analyses for comparing these three bilingual program types on the Stanford 9 reading, math, and language tests, administered to the students in Spring 2000. The same comparison groups were used for the English measure as for the Spanish measure for the LEP student groups — TBE schools of the same socioeconomic status and neighborhood as the DBE and TWBI schools.

Since these students had significantly fewer hours of instruction in English in Grades PK-3 than the number of hours of instruction in Spanish (the 90-10 bilingual program model), it was expected that their performance in English would not yet be on grade level by the end of elementary school, but that they would be approaching grade-level performance in their second language, English, sometime during the middle school years (6th or 7th grade), as we have seen in our data from other bilingual schools and other researchers' studies of bilingual schooling. But once they reach the 50th percentile in English, bilingually schooled students typically maintain that general level of achievement through the remainder of their secondary years (as seen in Thomas & Collier, 1997). In this school district, that pattern is evident among the graduates of transitional bilingual education in the district-wide data presented in a previous section. This represents a remarkable level of achievement, higher than that we have seen in other research sites implementing traditional transitional bilingual programs that provide only 2-3 years of native language support for a small portion of the day, before transition into all-English instruction.

Another expectation for LEP achievement in English is that transitional bilingual students might initially outperform the developmental bilingual and two-way bilingual students in English, because they receive a greater percentage of English instruction in Grades 4 and 5 than the other two groups. But overall, DBE and TWBI should eventually result in the highest achievement in both English and Spanish, with each additional year of school, as seen in other research studies (e.g. Cummins, 2000; Lindholm-Leary, 2001; Thomas & Collier, 1997). The general patterns in this dataset, however, show that all three groups were doing remarkably well in English, with the Two-way Bilingual Immersion former LEP students scoring the highest on all three measures. As can be seen in Table C-7, as well as in Figures C-8, C-9, and C-10, the Two-way LEP students were above the 50th NCE on all measures in English for every grade level.

On the reading measure (Figure C-8), the Two-way LEP students were at the 60th NCE (68th percentile) in first grade, such a high level that it typically cannot be maintained, as the test becomes cognitively more complex in subsequent grades. In the remaining grades, they ranged from the 51st to the 55th NCE, a more normal range of scoring. They ended fifth grade at the 51st NCE, well above their comparison groups, who dropped to the 39th-41st NCE range, having initially achieved at the 50th percentile in first grade.

In mathematics achievement in English (Figure C-9), all three groups were mostly on or above grade level, with most of the scores in the 45th-54th NCE range at each grade level for TBE and

DBE students. The DBE students started at the 45th NCE in first grade and reached the 51st NCE by fifth grade, and the TBE students reached mostly comparable levels. But again, the Two-way LEP students achieved higher levels in math in English than their comparison groups, and they stayed consistently above the other groups' achievement, ranging from the 56th to the 61st NCE, at the 59th NCE (66th percentile) by fifth grade. The Two-way LEP students ranged from 7 to 16 NCEs higher than their TBE comparison group, which is very significant high achievement, given that the TBE group performed in the range of the 50th NCE (46th-54th) for four of the five grade levels.

On the language arts measure in English (Figure C-10), again the Two-way LEP group outperformed their comparison groups, at the 55th NCE (60th percentile) in fifth grade, 7 NCEs higher than the DBE group and 9 NCEs higher than their TBE comparison group. All groups at all grade levels ranged from the 45th to the 62nd NCE, generally just above or just below the 50th percentile, excellent achievement in English. This demonstrates that their academic work in Spanish did not in any way hinder their English language development. In fact, in comparison to our other data from schools that teach LEP students exclusively in English, these scores are very high, much higher than LEP students who are schooled only in English.

The quasi-longitudinal look at the Stanford 9 data in Table C-8 is somewhat less meaningful than the same analysis on the Aprenda 2, because as the data is broken down by grade level as well as by number of years in the program, the number of students in each group becomes too low to compare students' performance statistically. When the number (N) is less than 20-30, the mean becomes less reliable in the measurement sense in this large a dataset, but may still be useful for some decision making. We have adopted the criterion that groups with Ns less than 10 should be skipped for comparisons between groups. The reason for lower numbers of students in this test administration is that it is not appropriate to administer the Stanford 9 to new arrivals not yet proficient in English, until they have had at least two years of exposure to the English language.

Overall in this table, where the number of students is sufficiently large in each group to analyze comparisons, the same general pattern is present as seen in the cross-sectional examination. Two-way LEP students remain the highest achievers, scoring mostly above the 50th percentile in every measure except for the reading test in some occasions. Since this is the most difficult subtest at this level, requiring knowledge across the curriculum, we do not typically see students reach the 50th percentile in reading in their second language until sometime during the middle school years (Grades 6-8). In math achievement, all three groups do quite well, generally staying at or above the 50th percentile.

Waivered LEP Students. Although the Texas state legislation requires that LEP students receive bilingual/ESL services, parents in U.S. schools may choose what school programs their children attend. Accordingly, parents may sign a waiver requesting that their children not be placed in the state-mandated or district-mandated programs. Although bilingual/ESL staff counsel against such a decision, some parents choose for their children to be placed in the English mainstream classroom with no special support provided by bilingual and ESL teachers. In the initial section on student achievement, we presented the district-wide findings on these waivered LEP students. Their academic achievement was dramatically below that of their counterparts who received bilingual/ESL services, completing the eleventh grade reading measure at the 12th percentile (25th NCE), with a dropout rate of 4.6 percent and retention-in-grade rate of 13.9 percent, the highest of any group in the school district.

In Tables C-9 and C-10, we present a subset of the data on waivered LEP students, focusing on those who attended the TBE and DBE schools. Our assumption we were testing was that perhaps the waivered students would do better in school than the district-wide analyses showed when they attended the same schools where their Hispanic counterparts were attending bilingual classes. This might be true because they would interact in social situations in the school, during recess and lunch and specials (art, music, physical education, etc.) and support each other on the social/emotional side of learning, making it a little less oppressive for these LEP students attending all-English mainstream classes from the first day of their arrival.

Our assumption was not supported by the data. When comparing data in our analyses in Table C-9 to the district-wide analyses in Figure C-1 and Tables C-1 and C-2, these LEP waivered students' English achievement in both reading and math is comparable to the district-wide data on LEP waivered students. They are not doing at all well in school. In reading, first grade students are at the 48th NCE, but the average scores go down with each succeeding grade, until this group in Grade 6 is at the 25th NCE (12th percentile). In math, scores are at the 44th NCE in first grade and reach grade-level achievement at the 53rd NCE in third grade but by sixth grade, they are achieving at the 36th NCE (25th percentile). In English language arts, average scores start at the 52nd NCE but reach the 30th NCE (17th percentile) by sixth grade. Table C-10 breaks these groups down by type of school they attend, with mostly similar results. Only the TBE schools that served as comparisons for the Two-way Bilingual schools provided a context for higher achievement among the waivered LEP students. This higher achievement may be related to socioeconomic factors, since a few of the TWBI schools and their comparison TBE schools serve neighborhoods that are somewhat more middle-class. Overall, given the very low achievement district-wide of the waivered LEP students, we would strongly recommend that parents be counseled as to the long-term consequences of their denying their children bilingual/ESL services.

Native-English speakers in Two-way Bilingual classes. Finally, how are the native-English speakers doing when schooled through two languages? Tables C-11 and C-12 summarize the data on these students. As can be seen in these tables, the number of students from these datasets are not yet high enough to make any grand generalizations, but the small number of students tested in both Spanish (N = 42) and English (N = 68) are certainly doing well. They are well above the 50th percentile in all subjects in both languages, for the grades tested, and their scores are increasing with each subsequent grade level. Their overall mean across the grade levels tested is the 66th

NCE in Spanish reading, 63rd NCE in Spanish math, 62nd NCE in Spanish language arts, 61st NCE in English reading, 61st NCE in English math, and 63rd NCE in English language arts (70th-78th percentile). They are receiving schooling 90 percent of the day in Spanish for kindergarten and first grade in this integrated model with Spanish-speakers, yet their English language achievement is equally high with their Spanish achievement. Not until Grade 4 does the instruction become 50 percent in each language. The 90-10 bilingual model does not in any way lessen these students' achievement in English. In fact, schooling intensely through Spanish in the early grades seems to enhance their English achievement, when compared to district-wide test scores, which cluster around the 50th percentile. This provides still more evidence that in the long-term, bilingually schooled students outperform monolingually schooled students.

Conclusions

The Houston data makes a very compelling case for U.S. school reform efforts to address language minority students' needs through strong (not watered down), effective, enrichment bilingual programs. This is the fifth-largest school system in the country, serving a majority "at risk" population — over 75 percent of low-income and 90 percent minority student population — presenting a huge challenge to educate so many students with great needs. The school staff admit that the programs are still a "work in progress." There are many needs yet to be addressed, and not all teachers are implementing the program models faithfully. But school improvement is occurring every year with demonstrated higher student achievement each year, both on the state's standardized measures, the Texas Assessment of Academic Skills (which we have not reported on here, since this is a national study), and on the national norm-referenced tests given at every grade level — the Stanford 9 and the Aprenda 2.

The bilingual/ESL experts in the Multilingual Programs Department have made a concerted effort to define in detail and then continue to refine the program models for bilingual and ESL classes. They also disseminate the models that work best through continuous staff development efforts throughout the school district. The Houston multilingual staff are exemplary implementors of ongoing school reform, identifying what works from the research on school effectiveness for language minority students, defining clear plans for changes to be made, and evaluating the results by measuring student achievement year by year. They know that change does not occur quickly, but it must be implemented steadily and effectively. Each school year, several more Houston schools commit to implementing the two models found most effective, two-way and one-way enrichment bilingual education, with 11 two-way bilingual and 24 one-way developmental bilingual schools as of August, 2001.

Student achievement is clearly the highest in the two-way bilingual immersion schools, both for students who begin schooling with no or limited proficiency in English, and for native-English speakers who choose to be in the bilingual classes. Both of these groups, by fifth grade, are on or above grade level in both English and Spanish. Both groups have reached at least the 70th percentile in Spanish reading, math, and language arts; and the 60th to 66th percentile in English language arts and math. In English reading (the most difficult subtest, because it tests all curricular subjects), the Spanish speakers reached the 51st percentile in fifth grade.

The next highest language minority student achievement occurs in the schools where a strong emphasis on primary language instruction is provided in the first years of schooling. Because the transitional bilingual classes and the developmental bilingual classes are both implemented as a 90-10 model (emphasizing the minority language in the early grades PK-1) through third grade, it is not until fourth grade that these two models are differentiated in Houston. Therefore we found fewer differences in student achievement between these two models by fifth grade (the last year of this study), although among some groups the developmental bilingual students were achieving at a higher level than the transitional bilingual students. We would predict that more differences will emerge as the students reach the middle school years, with developmental bilingual students outperforming transitional bilingual students. Many of the schools that have offered transitional bilingual education are gradually transforming their bilingual services into more primary language support in fourth and fifth grades, so that students receive half a day of instruction in each language, thus becoming a one-way developmental bilingual education model.

Transitional bilingual graduates are achieving at a significantly higher level than students who received content ESL services, as shown in the district-wide data for Grades 2-11. It is worth noting that, initially, students who receive all their schooling in English through ESL content classes appear to be doing better on the English tests than their bilingually schooled counterparts. But by ninth grade, significant between-group differences in achievement begin to appear, and those that received primary language support in their elementary school years reach a higher level of achievement than those who received an ESL content program without primary language support. This difference is most visible in the reading measure of the Stanford 9 at eleventh grade, with bilingually schooled students 7 NCEs higher than the ESL content graduates, a significant difference equivalent to one-third of a national standard deviation.

Those LEP students who received no bilingual/ESL services because their parents chose to place them in the English mainstream upon enrollment are the lowest achievers of all. Their eleventh grade achievement was the 12th percentile in English reading and the 22nd percentile in math. They are the group with the highest dropout rate and they have been retained in grade more than any other group. We would not recommend this alternative to language minority families.

Houston Independent School District has taken the initiatives of their former superintendent, Dr. Rod Paige, who is currently serving as the U.S. Secretary of Education, and has continued to improve upon their school reform models for language minority students. The school board approved the following mission statement in July, 1999:

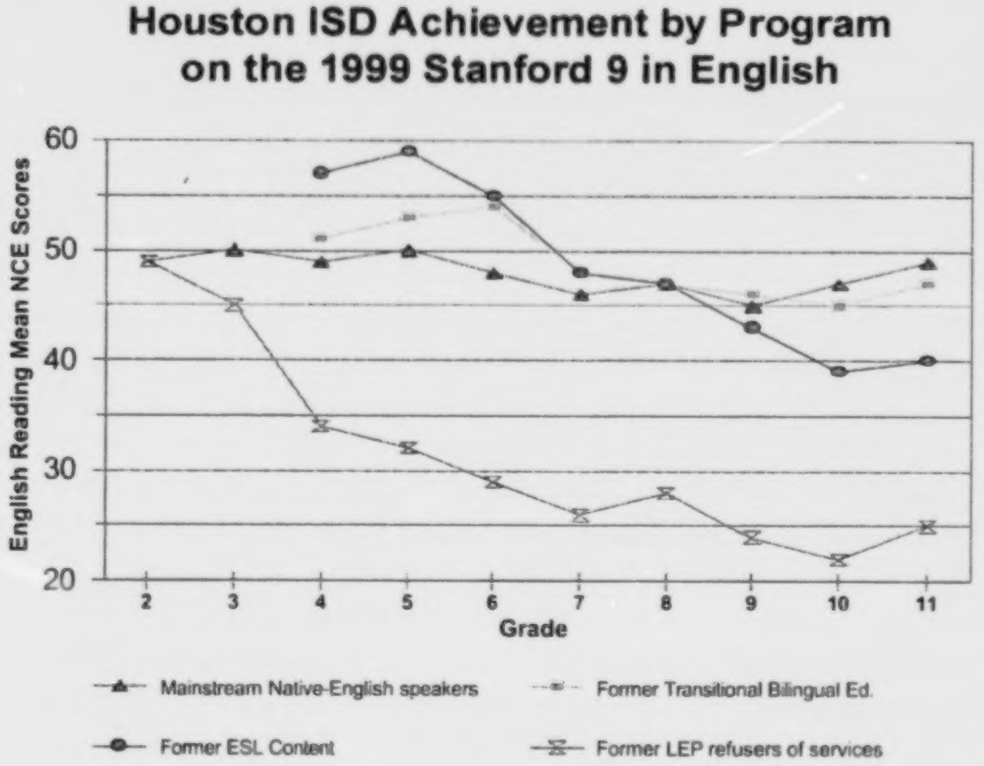
> It is the mission of HISD's Multilingual Programs to strengthen the social and

> economic foundations of Houston by assuring that its students achieve their full academic potential and by providing opportunities for all students to graduate proficient in multiple languages. Limited-English-proficient children also will learn to read, write, and speak English as rapidly as individually possible.

The core beliefs attached to the mission statement end with this sentence: "Increasingly, HISD should offer opportunities for all students to acquire two languages to excel in a competitive global marketplace." Given the high level of academic achievement attained by the graduates of all three bilingual program types in Houston schools, as measured in both English and Spanish, this urban school system seems to be on a continuing course for providing strong, quality bilingual instruction to as many students as possible. Based on their testing results, we believe that the Houston school district's program and implementation strategies are worthy of emulation by other school districts who wish to provide more effective instruction for both language minority and native-English-speaking students. Ultimately, the region and the nation will benefit, as the schools prepare the future workforce of the 21st century.

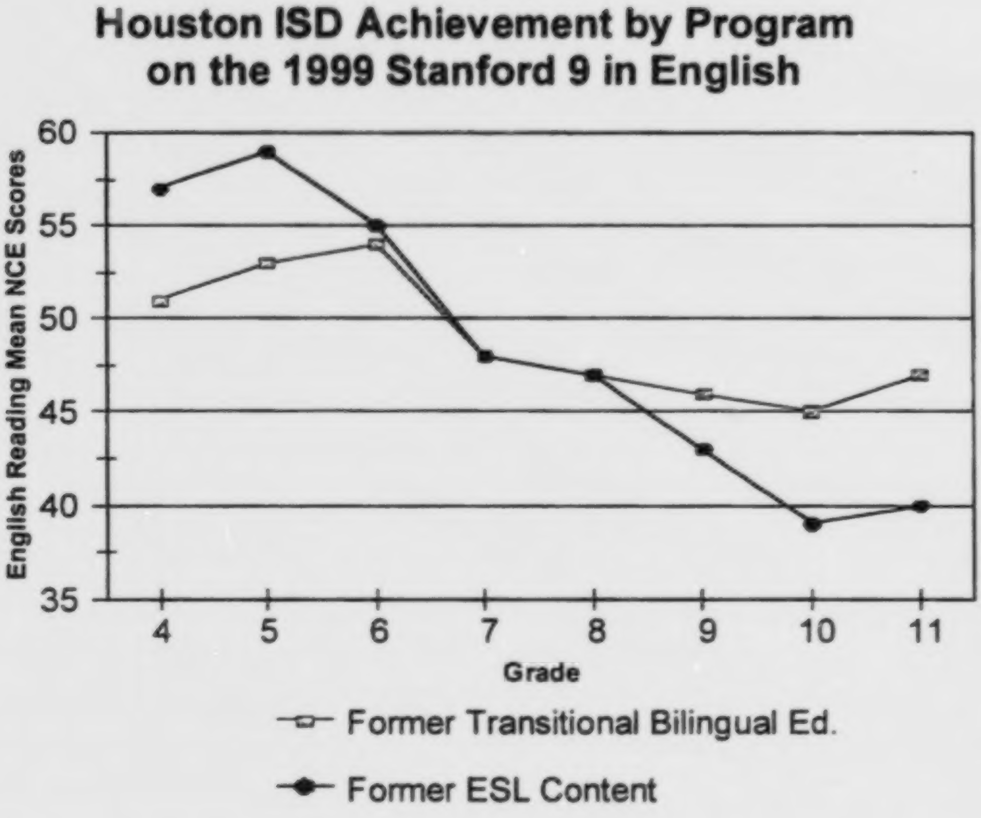
South-Central U.S. Large Urban Research Site - Figures

Figure C-1
Cross-sectional analyses



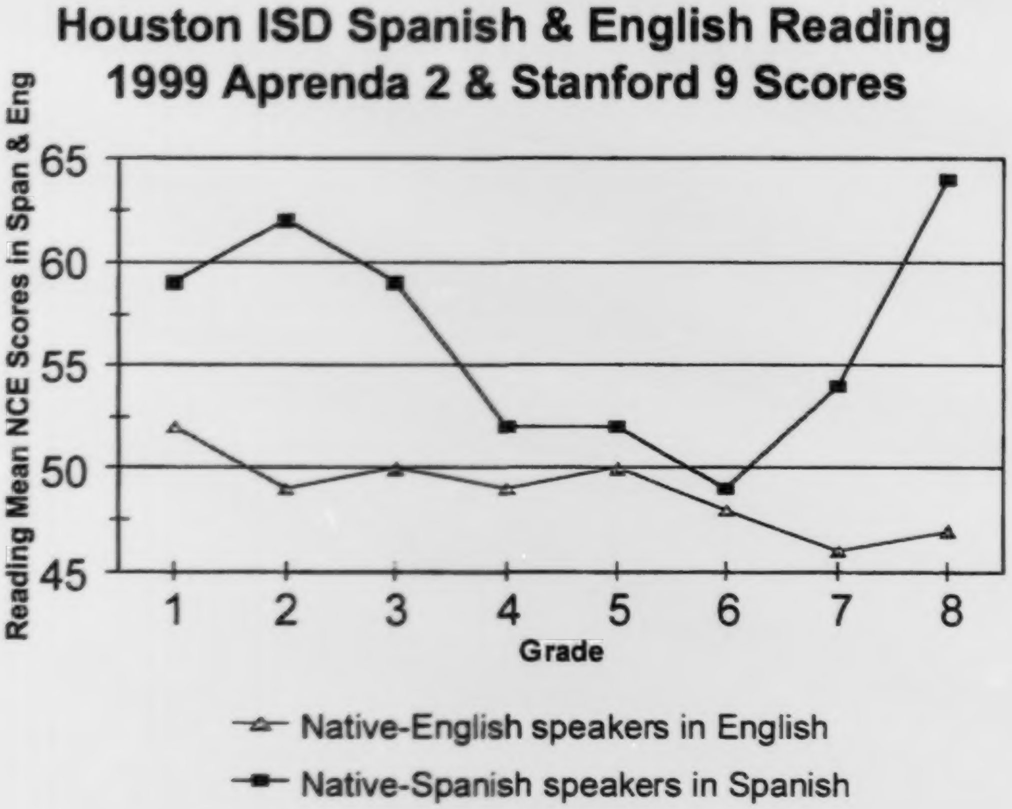
Mainstream Native-English speakers	N = 103,887
Former Transitional Bilingual Education students	N = 3,333
Former ESL Content students	N = 3,655
Former LEP students whose parents refused Bilingual/ESL services	N = 1,599

Figure C-2
Cross-sectional analyses



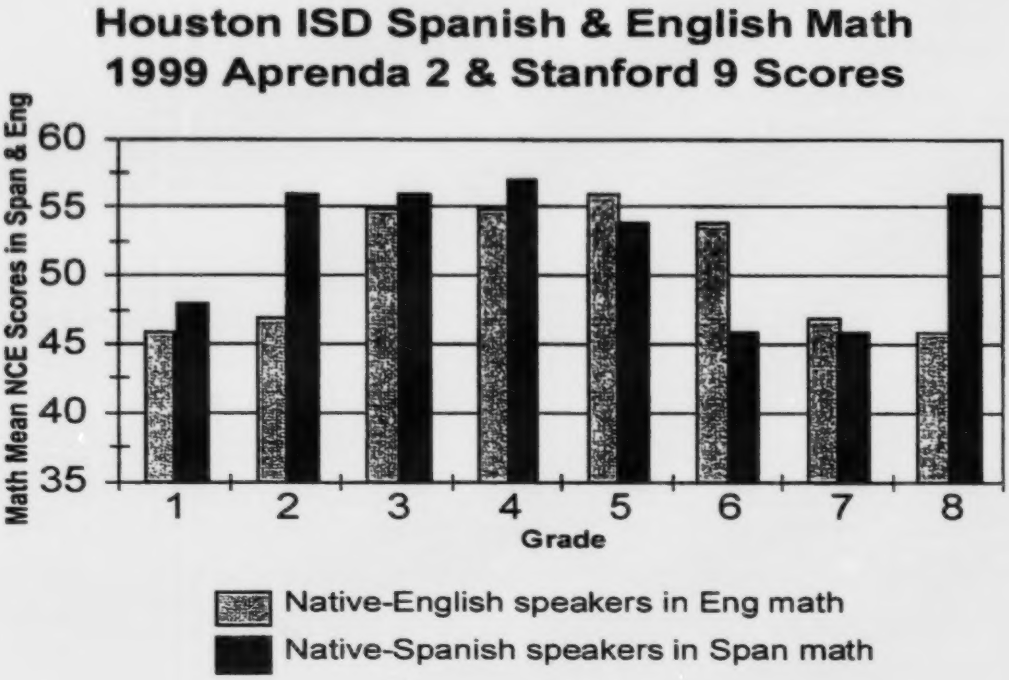
Former Transitional Bilingual Education students	N = 3,333
Former ESL Content students	N = 3,655

Figure C-3
Cross-sectional analyses



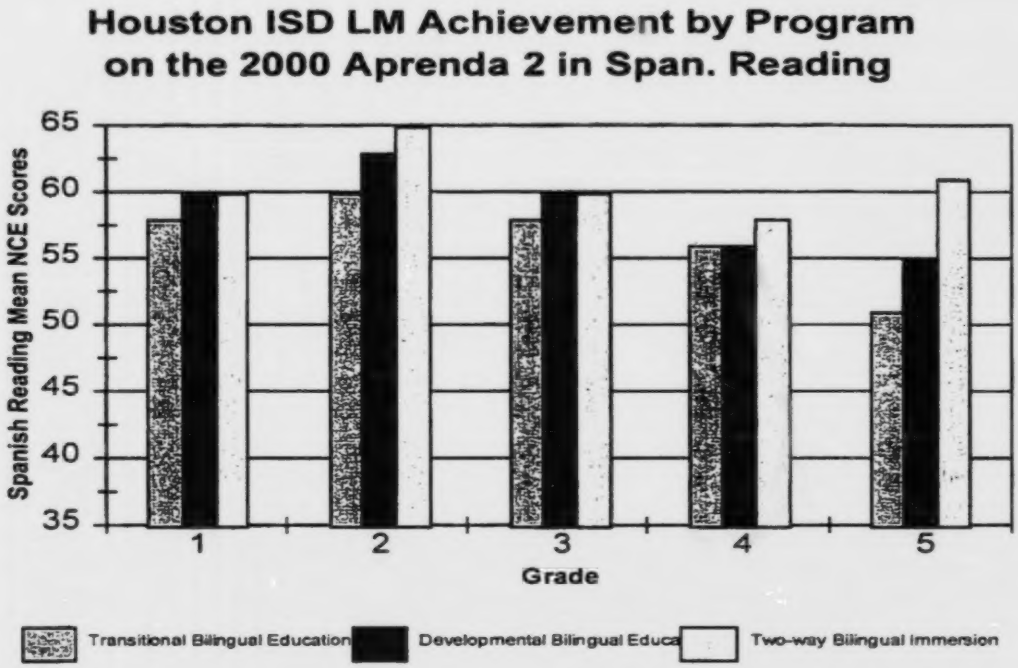
Native-English speakers in mainstream	N = 103,887
Native-Spanish speakers in bilingual education	N = 19,281

Figure C-4
Cross-sectional analyses



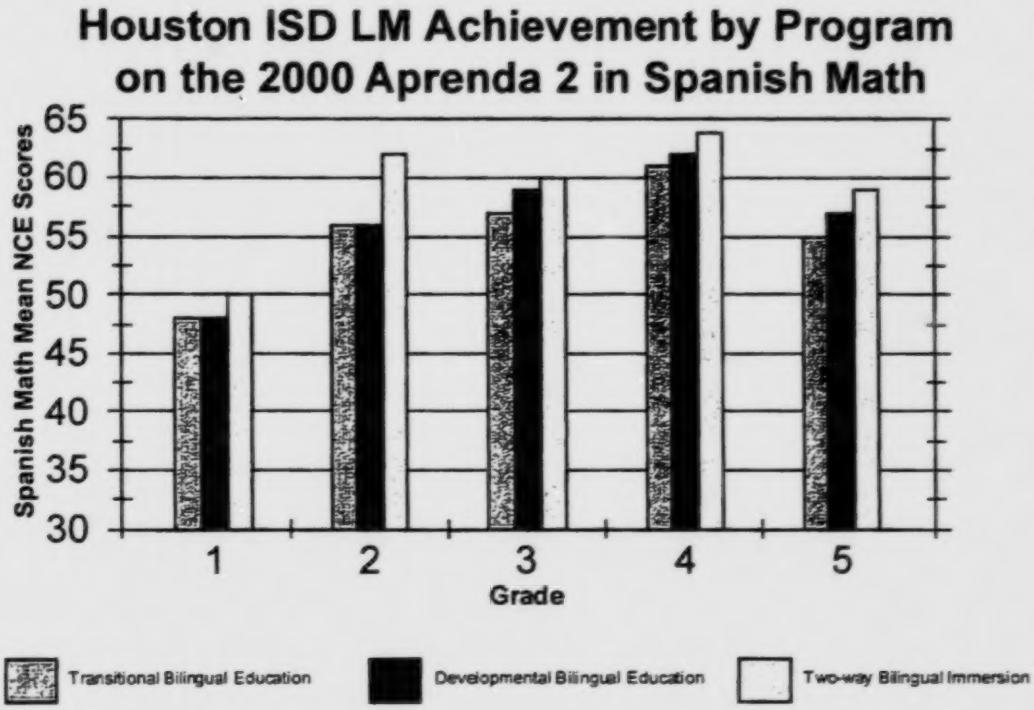
Native-English speakers in mainstream	N = 103,887
Native-Spanish speakers in bilingual education	N = 19,281

Figure C-5
Cross-sectional analyses



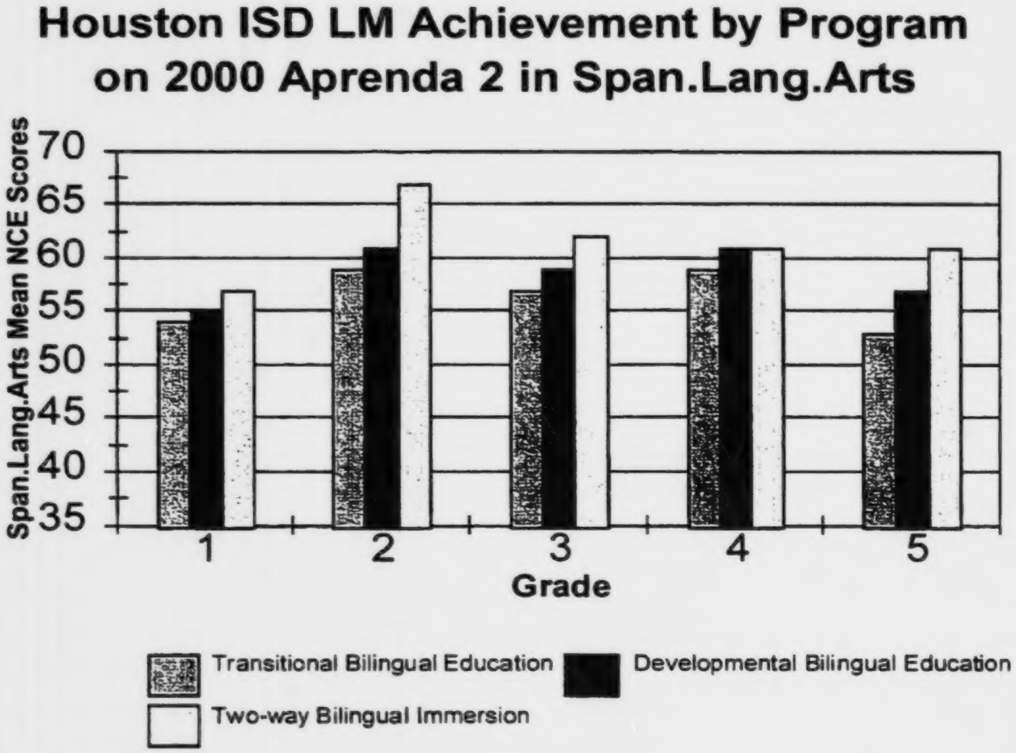
(See Table C-4 for number of students by program and by grade.)

Figure C-6
Cross-sectional analyses



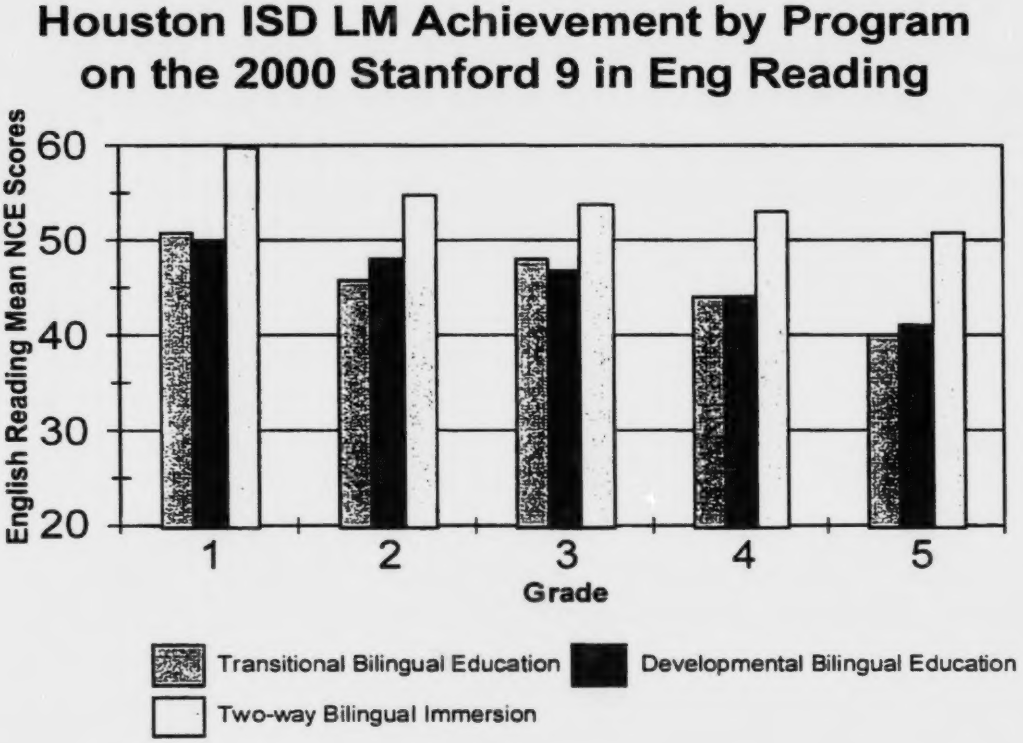
(See Table C-4 for number of students by program and by grade.)

Figure C-7
Cross-sectional analyses



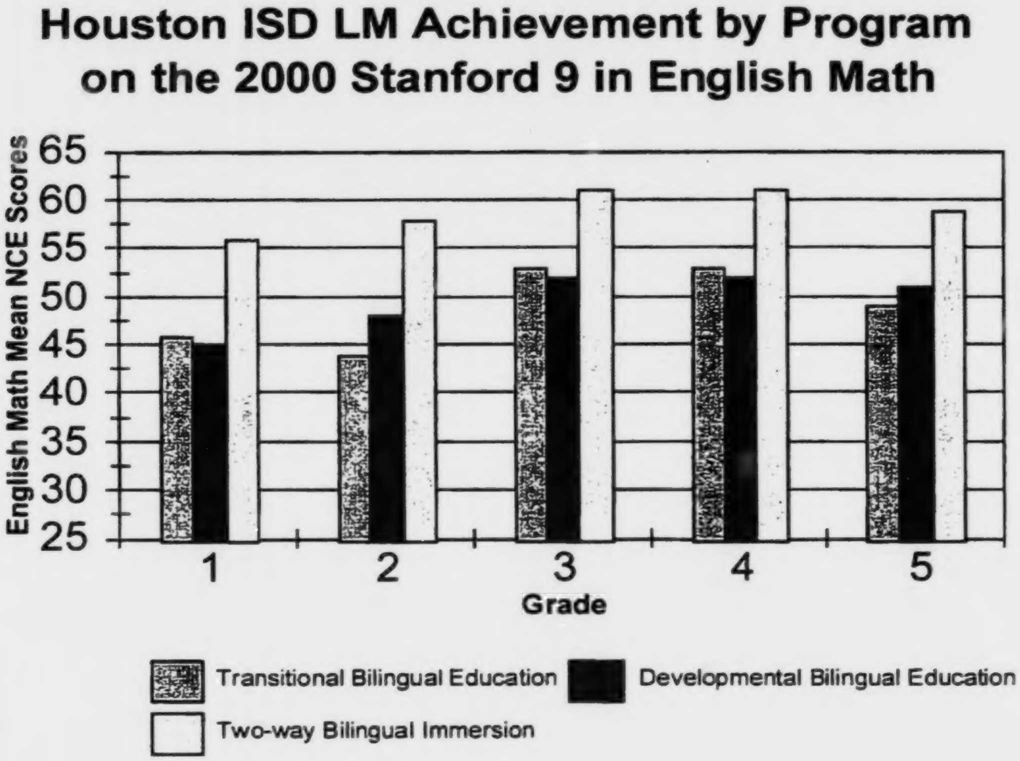
(See Table C-4 for number of students by program and by grade.)

Figure C-8
Cross-sectional analyses



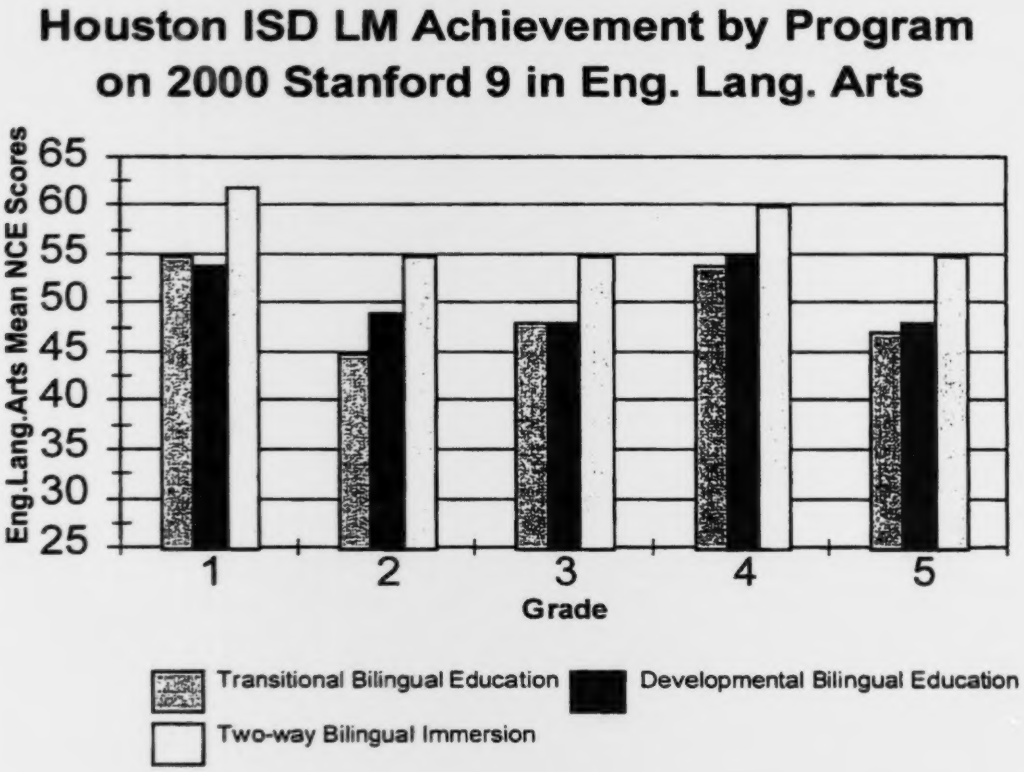
(See Table C-7 for number of students by program and by grade.)

Figure C-9
Cross-sectional analyses



(See Figure C-7 for number of students by program and by grade.)

Figure C-10
Cross-sectional analyses



Houston ISD LM Achievement by Program on 2000 Stanford 9 in Eng. Lang. Arts

(See Table C-7 for number of students by program and by grade.)

South-Central U.S. Large Urban Research Site - Tables

Table C-1
1999 Reading Mean NCE Scores on the Stanford 9 in English
for Students Initially Classified as LEP Compared to Non-LEP Students by Program Type:
Cross-sectional Analyses

Grade	Native-English Speakers in Mainstream N = 103,887	Former LEP Students Who Are Graduates of Transitional Bilingual Education N = 3,333	Former LEP Students Who Are Graduates of ESL Content (No First Language Support) N = 3,655	Former LEP Students Whose Parents Refused Bilingual/ESL Services N = 1,599
2	49			49
3	50			45
4	49	51	57	34
5	50	53	59	32
6	48	54	55	29
7	46	48	48	26
8	47	47	47	28
9	45	46	43	24
10	47	45	39	22
11	49	47	40	25

Table C-2
1999 Mathematics Mean NCE Scores on the Stanford 9 in English
for Students Initially Classified as LEP Compared to Non-LEP Students by Program Type:
Cross-sectional Analyses

Grade	Native-English Speakers in Mainstream N = 103,887	Former LEP Students Who Are Graduates of Transitional Bilingual Education N = 3,333	Former LEP Students Who Are Graduates of ESL Content (No First Language Support) N = 3655	Former LEP Students Whose Parents Refused Bilingual/ESL Services N = 1,599
2	47			49
3	55			52
4	55	66	66	45
5	56	57	69	44
6	54	61	64	41
7	47	51	51	34
8	46	46	49	34
9	48	49	49	38
10	48	47	44	34
11	46	44	41	34

Table C-3
1999 Reading and Math Mean NCE Scores on the Stanford 9 in English for Native-English Speakers Compared to the Reading and Math Mean NCE Scores on the Aprenda 2 in Spanish for LEP Students Attending Transitional Bilingual Education: Cross-sectional Analyses

Grade	Native-English Speakers in Mainstream: 1999 NCE Scores Total Reading in English N = 103,887	Native-Spanish Speakers in Bilingual Education: 1999 NCE Scores Total Reading in Spanish N = 19,281	Native-English Speakers in Mainstream: 1999 NCE Scores Total Math in English N = 103,887	Native-Spanish Speakers in Bilingual Education: 1999 NCE Scores Total Math in Spanish N = 19,281
1	52	59	46	48
2	49	62	47	56
3	50	59	55	56
4	49	52	55	57
5	50	52	56	54
6	48	49	54	46
7	46	54	47	46
8	47	64	46	56

Table C-4

2000 Reading, Math, and Language Mean NCE Scores on the Aprenda 2 in Spanish for Students Initially Classified as LEP Compared by Grade and by Program Type: Developmental Bilingual Education (DBE), Two-way Bilingual Immersion (TWBI), and Transitional Bilingual Education (TBE) Comparison Groups for the DBE and TWBI Schools, and

Native-English Speakers in TWBI: Cross-sectional Analyses

Grade	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
1	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	59.1742	49.3486	56.6755
		N	1422	1419	1419
		Std. Deviation	17.0325	18.4156	14.4633
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	59.8049	47.7544	55.3922
		N	1575	1569	1573
		Std. Deviation	16.9601	18.1668	14.0301
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	56.8101	47.2484	51.0376
		N	276	275	274
		Std. Deviation	16.9428	17.1063	14.7592
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	60.4132	50.1337	56.8725
		N	448	448	448
		Std. Deviation	17.6134	19.1282	15.5439
	Total	Mean	59.4150	48.6137	55.7398
		N	3721	3711	3714
		Std. Deviation	17.0802	18.3231	14.5087
2	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	61.7132	57.6553	62.3476
		N	1337	1337	1336
		Std. Deviation	16.6988	17.5140	18.5197
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	63.1054	55.8875	61.4383
		N	1398	1397	1395
		Std. Deviation	16.6410	17.5339	18.2842
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	58.4151	53.9856	57.1913
		N	265	263	263
		Std. Deviation	16.8289	19.7260	19.5824
	Native-English Speakers Attending Two-way Bilingual Immersion	Mean	58.5667	50.8833	55.1833
		N	6	6	6
		Std. Deviation	32.7709	33.1351	33.2525
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	64.6304	61.8492	66.6978
		N	372	372	372
		Std. Deviation	16.9429	18.2833	19.3309
	Total	Mean	62.3463	57.0878	62.0364
		N	3378	3375	3372

Table C-4 (continued)

Grade	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
3	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	57.7729	56.8398	58.6607
		N	1250	1249	1248
		Std. Deviation	14.5803	16.2137	16.9634
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	60.1007	59.3799	59.0452
		N	1366	1364	1366
		Std. Deviation	15.1125	16.1918	16.6885
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	58.1415	56.8990	54.6971
		N	207	207	207
		Std. Deviation	14.2236	14.5014	16.4530
	Native-English Speakers Attending Two-way Bilingual Immersion	Mean	62.8273	59.6000	61.2273
		N	11	11	11
		Std. Deviation	18.6158	19.4133	21.9598
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	59.6649	59.7536	62.4070
		N	373	373	373
		Std. Deviation	14.0634	15.3025	15.7834
	Total	Mean	59.0256	58.2737	59.0134
		N	3207	3204	3205
		Std. Deviation	14.7763	16.0498	16.7658
4	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	52.8047	57.1007	57.1912
		N	764	764	764
		Std. Deviation	15.7650	16.4644	15.4414
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	56.4233	61.7628	60.8002
		N	1007	1004	1007
		Std. Deviation	15.7745	17.3343	14.7295
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	59.1609	65.6039	60.6945
		N	128	128	128
		Std. Deviation	16.2677	18.4287	14.8432
	Native-English Speakers Attending Two-way Bilingual Immersion	Mean	60.2700	61.5400	59.9300
		N	10	10	10
		Std. Deviation	17.7285	14.6389	17.4733
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	57.7714	64.3912	61.1726
		N	241	240	241
		Std. Deviation	15.5880	16.0698	13.9932
	Total	Mean	55.4694	60.6251	59.5492
		N	2150	2146	2150
		Std. Deviation	15.9149	17.1700	15.0157

Table C-4 (continued)

Grade	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
5	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	53.0072	53.9971	54.2243
		N	516	516	515
		Std. Deviation	15.3463	13.7283	12.9114
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	55.2096	57.1497	57.4017
		N	292	292	291
		Std. Deviation	17.1556	14.4078	13.5468
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	49.5746	55.9194	52.5742
		N	63	62	62
		Std. Deviation	20.5586	20.1931	18.4486
	Native-English Speakers Attending Two-way Bilingual Immersion	Mean	74.0133	70.2800	67.9000
		N	15	15	15
		Std. Deviation	12.1752	11.0660	13.4977
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	61.0536	58.5543	60.9671
		N	140	140	140
		Std. Deviation	16.3725	13.4340	15.2368
	Total	Mean	54.8283	55.8722	56.1514
		N	1026	1025	1023
		Std. Deviation	16.7306	14.5086	14.0925
Total	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	57.9540	54.7734	58.3955
		N	5301	5297	5294
		Std. Deviation	16.3566	17.3137	16.3777
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	59.8507	55.5736	58.8411
		N	5642	5630	5636
		Std. Deviation	16.4226	17.9956	16.1040
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	57.3916	54.3678	55.0069
		N	939	935	934
		Std. Deviation	16.6469	18.6557	17.1540
	Native-English Speakers Attending Two-way Bilingual Immersion	Mean	65.6048	62.6310	62.4381
		N	42	42	42
		Std. Deviation	19.4224	18.9480	20.0559
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	60.8850	58.1102	61.5288
		N	1574	1573	1574
		Std. Deviation	16.3896	17.9356	16.6980
	Total	Mean	59.0733	55.4935	58.7255
		N	13498	13477	13480
		Std. Deviation	16.4604	17.8064	16.4270

Table C-5

2000 Reading, Math, and Language Mean NCE Scores on the Aprenda 2 in Spanish for Students Initially Classified as LEP Compared by Program Type and by Number of Years Attending Program: DBE, TWBI and Comparison Groups in TBE: Quasi-Longitudinal Analyses

Number of Student Years in Program– from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
1 year	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	54.5337	49.6100	52.7668
		N	412	412	410
		Std. Deviation	17.8427	18.2276	16.5943
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	56.7732	49.8996	53.6812
		N	463	461	462
		Std. Deviation	17.5663	18.8247	16.6494
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	56.8038	53.3276	52.4276
		N	106	105	105
		Std. Deviation	19.3015	21.3998	19.0457
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	63.2724	55.5449	61.1286
		N	98	98	98
		Std. Deviation	16.9486	18.4440	17.9991
	Total	Mean	56.5114	50.6374	53.8889
		N	1079	1076	1075
		Std. Deviation	17.9290	18.8998	17.1385
2 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	58.4812	52.2648	57.7191
		N	648	645	648
		Std. Deviation	16.7926	18.6658	16.1024
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	58.6121	50.6824	56.2436
		N	638	636	637
		Std. Deviation	16.9390	19.0177	15.5217
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	58.4009	52.2645	54.7927
		N	110	110	110
		Std. Deviation	16.0440	19.2275	17.5109
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	60.1249	52.0432	57.1402
		N	169	169	169
		Std. Deviation	16.8294	19.6104	16.0678
	Total	Mean	58.7064	51.5956	56.8498
		N	1565	1560	1564
		Std. Deviation	16.7967	18.9501	15.9772

Table C-5 (continued)

Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
3 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	61.5549	53.3833	59.8332
		N	1287	1287	1286
		Std. Deviation	16.0830	18.0384	15.7549
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	62.6231	52.1583	58.0870
		N	1336	1334	1336
		Std. Deviation	15.5854	17.3291	14.7600
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	59.4729	50.7839	53.8181
		N	207	205	204
		Std. Deviation	15.2539	16.3140	15.0127
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	62.9915	55.1380	60.1939
		N	363	363	363
		Std. Deviation	17.3881	19.9843	17.0034
	Total	Mean	62.0302	52.9035	58.7579
		N	3193	3189	3189
		Std. Deviation	15.9961	17.8992	15.5213
4 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	61.1288	58.2778	62.0419
		N	1125	1125	1125
		Std. Deviation	15.6082	16.6619	17.0109
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	62.9435	57.8410	62.0513
		N	1199	1199	1197
		Std. Deviation	15.8492	17.2537	17.5460
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	59.9113	55.5206	58.8966
		N	204	204	204
		Std. Deviation	15.8674	18.7416	17.9324
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	61.6494	61.2672	63.6609
		N	601	600	601
		Std. Deviation	15.2114	16.0643	16.0607
	Total	Mean	61.8448	58.5040	62.1515
		N	3129	3128	3127
		Std. Deviation	15.6642	16.9796	17.1279

Table C-5 (continued)

Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
5 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	54.1682	56.3062	57.1841
		N	1686	1685	1684
		Std. Deviation	15.0924	15.4748	15.6089
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	57.7189	60.6089	60.3106
		N	1832	1826	1830
		Std. Deviation	15.7604	16.4220	15.1880
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	54.9626	59.1643	55.7201
		N	270	269	269
		Std. Deviation	15.9110	16.5681	15.6429
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	58.3926	60.9907	62.0917
		N	204	204	204
		Std. Deviation	15.0508	15.5498	15.2093
	Total	Mean	56.0673	58.7111	58.7715
		N	3992	3984	3987
		Std. Deviation	15.5514	16.1241	15.5015
Total	Non-DBE LEP LEP Comparison Group Attending Transitional BE	Mean	58.1005	54.9656	58.6216
		N	5158	5154	5153
		Std. Deviation	16.2433	17.2300	16.2936
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	60.0869	55.8725	59.1131
		N	5468	5456	5462
		Std. Deviation	16.2322	17.8566	15.9839
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	57.7681	54.8719	55.5096
		N	897	893	892
		Std. Deviation	16.3023	18.2335	16.8091
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	61.4572	58.1982	61.6199
		N	1435	1434	1435
		Std. Deviation	16.1307	17.9861	16.4466
	Total	Mean	59.2874	55.6999	58.9470
		N	12958	12937	12942
		Std. Deviation	16.2749	17.6761	16.2663

Table C-6
2000 Reading, Math, and Language Mean NCE Scores on the Aprenda 2 in Spanish
for Students Initially Classified as LEP Compared by Grade, Program Type, and Number of Years
Attending Program: DBE, TWBI and Comparison Groups in TBE: Quasi-Longitudinal Analyses

Grade	Number of Student Years in Program-- from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
1	1 year	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	54.4696	45.1435	52.5781
			N	138	138	137
			Std. Deviation	18.9480	19.4382	14.3363
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	55.7710	44.8162	53.7863
			N	169	167	168
			Std. Deviation	19.3661	20.1860	14.9413
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	54.1590	44.0684	48.5684
			N	39	38	38
			Std. Deviation	19.7131	18.2865	16.5702
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	59.5200	46.5100	57.7675
			N	40	40	40
			Std. Deviation	19.8985	18.4416	17.6326
		Total	Mean	55.5313	45.0368	53.2522
			N	386	383	383
			Std. Deviation	19.2912	19.4945	15.2876
	2 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	57.1335	47.6154	55.7072
			N	361	358	361
			Std. Deviation	17.1925	18.7363	14.5916
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	57.3924	45.4700	54.3147
			N	395	393	394
			Std. Deviation	17.5807	18.6926	14.4215
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	55.1210	45.1048	49.5919
			N	62	62	62
			Std. Deviation	16.3498	16.6010	16.4958
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	59.1144	47.8008	55.2085
			N	118	118	118
			Std. Deviation	17.0261	18.4567	14.4634
		Total	Mean	57.3592	46.5661	54.6520
			N	936	931	935
			Std. Deviation	17.2773	18.5536	14.6891

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
1	3 years (PK- Grade 1)	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	61.5250	50.9282	58.0591
			N	805	805	804
			Std. Deviation	15.9576	18.0393	14.4191
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	62.5469	49.9146	56.5763
			N	872	870	872
			Std. Deviation	15.4231	17.3154	13.5173
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	59.6951	49.9007	52.4042
			N	144	144	143
			Std. Deviation	15.4074	15.5693	13.2526
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	62.8100	51.9192	58.3530
			N	219	219	219
			Std. Deviation	17.4399	20.3639	15.6335
		Total	Mean	61.9706	50.5294	57.0594
			N	2040	2038	2038
			Std. Deviation	15.8698	17.8383	14.1662
2	1 year	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	58.9815	53.0864	57.2309
			N	81	81	81
			Std. Deviation	18.1902	17.2730	20.4760
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	59.1723	50.8584	55.7149
			N	101	101	101
			Std. Deviation	19.1674	19.6436	20.4003
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	57.8037	56.8444	53.3111
			N	27	27	27
			Std. Deviation	20.5122	23.0635	23.3015
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	67.9947	61.9632	67.1158
			N	19	19	19
			Std. Deviation	12.9181	18.6684	20.0752
		Total	Mean	59.6776	53.2842	56.9189
			N	228	228	228
			Std. Deviation	18.6112	19.3427	20.8847

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
2	2 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	62.7500	58.3455	62.3573
			N	110	110	110
			Std. Deviation	16.6304	16.3784	19.4079
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	64.5021	57.7104	61.7563
			N	96	96	96
			Std. Deviation	16.1103	17.5157	18.5958
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	64.0400	57.9760	61.2760
			N	25	25	25
			Std. Deviation	15.1751	19.0811	15.7588
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	66.7840	64.3440	65.2520
			N	25	25	25
			Std. Deviation	19.3340	21.1831	20.7674
		Total	Mean	63.9270	58.6570	62.3090
			N	256	256	256
			Std. Deviation	16.5315	17.5800	18.8380
	3 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	62.5782	57.1742	64.2112
			N	330	330	330
			Std. Deviation	16.9545	18.2205	18.4535
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	63.9950	54.8647	61.2697
			N	317	317	317
			Std. Deviation	15.6666	16.4323	16.7989
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	56.9109	48.7364	55.6795
			N	46	44	44
			Std. Deviation	16.3531	18.3514	19.9767
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	65.8545	60.4523	65.7114
			N	88	88	88
			Std. Deviation	17.9516	19.9529	19.7630
		Total	Mean	63.1886	56.1281	62.7018
			N	781	779	779
			Std. Deviation	16.6013	17.8750	18.1652

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
2	4 years (PK-Grade 2)	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	62.7875	59.4907	63.7067
			N	674	674	674
			Std. Deviation	16.2293	17.0771	17.8892
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	64.5774	57.4960	63.4563
			N	748	748	746
			Std. Deviation	16.0315	17.2979	18.1997
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	59.9993	54.9381	59.5731
			N	134	134	134
			Std. Deviation	16.0353	19.4370	19.2848
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	64.6979	62.0968	66.2442
			N	190	190	190
			Std. Deviation	16.2642	17.8858	19.6356
		Total	Mean	63.5482	58.5703	63.5584
			N	1746	1746	1744
			Std. Deviation	16.1753	17.5270	18.3670
3	1 year	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	56.5972	52.5292	51.7958
			N	72	72	71
			Std. Deviation	13.0152	15.3901	14.1206
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	57.6077	54.5033	51.3231
			N	91	91	91
			Std. Deviation	14.2746	15.5770	17.0466
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	57.6313	52.4750	52.5187
			N	16	16	16
			Std. Deviation	20.5720	21.3161	22.6726
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	63.2313	56.7688	61.5688
			N	16	16	16
			Std. Deviation	12.2494	11.9344	19.1364
		Total	Mean	57.6979	53.7938	52.4397
			N	195	195	194
			Std. Deviation	14.2768	15.7194	16.8490

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
3	2 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	58.2803	56.2066	59.0230
			N	61	61	61
			Std. Deviation	13.8116	16.6960	17.2824
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	57.9000	57.8662	56.2882
			N	68	68	68
			Std. Deviation	14.0478	16.4570	17.5600
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	55.5778	56.0889	57.2222
			N	9	9	9
			Std. Deviation	19.2360	12.7371	24.2389
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	59.5545	60.4000	56.1273
			N	11	11	11
			Std. Deviation	12.8039	19.2757	21.5389
		Total	Mean	58.0376	57.2664	57.4523
			N	149	149	149
			Std. Deviation	14.0827	16.4600	18.0432
	3 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	62.1610	58.8220	61.7683
			N	82	82	82
			Std. Deviation	13.6876	16.0487	14.2692
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	63.0455	60.8511	60.9966
			N	88	88	88
			Std. Deviation	15.1906	16.4377	16.6014
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	66.6250	60.9250	58.7375
			N	8	8	8
			Std. Deviation	8.0139	11.3962	13.2426
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	59.3207	58.5207	59.1966
			N	29	29	29
			Std. Deviation	13.9838	15.9664	15.9323
		Total	Mean	62.3116	59.7237	60.9628
			N	207	207	207
			Std. Deviation	14.2163	15.9867	15.4210

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
2	4 years (PK-Grade 2)	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	62.7875	59.4907	63.7067
			N	674	674	674
			Std. Deviation	16.2293	17.0771	17.8892
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	64.5774	57.4960	63.4563
			N	748	748	746
			Std. Deviation	16.0315	17.2979	18.1997
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	59.9993	54.9381	59.5731
			N	134	134	134
			Std. Deviation	16.0353	19.4370	19.2848
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	64.6979	62.0968	66.2442
			N	190	190	190
			Std. Deviation	16.2642	17.8858	19.6356
		Total	Mean	63.5482	58.5703	63.5584
			N	1746	1746	1744
			Std. Deviation	16.1753	17.5270	18.3670
3	1 year	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	56.5972	52.5292	51.7958
			N	72	72	71
			Std. Deviation	13.0152	15.3901	14.1206
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	57.6077	54.5033	51.3231
			N	91	91	91
			Std. Deviation	14.2746	15.5770	17.0466
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	57.6313	52.4750	52.5187
			N	16	16	16
			Std. Deviation	20.5720	21.3161	22.6726
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	63.2313	56.7688	61.5688
			N	16	16	16
			Std. Deviation	12.2494	11.9344	19.1364
		Total	Mean	57.6979	53.7938	52.4397
			N	195	195	194
			Std. Deviation	14.2768	15.7194	16.8490

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
3	2 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	58.2803	56.2066	59.0230
			N	61	61	61
			Std. Deviation	13.8116	16.6960	17.2824
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	57.9000	57.8662	56.2882
			N	68	68	68
			Std. Deviation	14.0478	16.4570	17.5600
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	55.5778	56.0889	57.2222
			N	9	9	9
			Std. Deviation	19.2360	12.7371	24.2389
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	59.5545	60.4000	56.1273
			N	11	11	11
			Std. Deviation	12.8039	19.2757	21.5389
		Total	Mean	58.0376	57.2664	57.4523
			N	149	149	149
			Std. Deviation	14.0827	16.4600	18.0432
	3 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	62.1610	58.8220	61.7683
			N	82	82	82
			Std. Deviation	13.6876	16.0487	14.2692
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	63.0455	60.8511	60.9966
			N	88	88	88
			Std. Deviation	15.1906	16.4377	16.6014
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	66.6250	60.9250	58.7375
			N	8	8	8
			Std. Deviation	8.0139	11.3962	13.2426
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	59.3207	58.5207	59.1966
			N	29	29	29
			Std. Deviation	13.9838	15.9664	15.9323
		Total	Mean	62.3116	59.7237	60.9628
			N	207	207	207
			Std. Deviation	14.2163	15.9867	15.4210

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
3	4 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	59.1313	57.2804	60.3722
			N	281	281	281
			Std. Deviation	14.1748	16.1816	16.6287
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	61.5497	60.4738	61.0303
			N	294	294	294
			Std. Deviation	15.4604	16.3625	17.1285
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	60.2550	59.9900	57.3075
			N	40	40	40
			Std. Deviation	14.6997	14.6693	16.8229
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	61.2776	60.3239	64.2652
			N	201	201	201
			Std. Deviation	13.7332	15.2794	14.4190
		Total	Mean	60.5864	59.3135	61.4180
			N	816	816	816
			Std. Deviation	14.5867	15.9995	16.3798
	5 years (PK-Grade 3)	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	57.0656	57.3239	58.8996
			N	724	723	723
			Std. Deviation	14.8220	15.9930	17.0214
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	60.1929	60.2865	60.0968
			N	777	775	777
			Std. Deviation	14.8928	15.6869	15.7620
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	57.6864	56.8760	54.7184
			N	125	125	125
			Std. Deviation	12.3788	12.9768	14.0957
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	58.0393	59.1107	60.8571
			N	84	84	84
			Std. Deviation	14.1777	15.9294	16.0811
		Total	Mean	58.5798	58.7241	59.2343
			N	1710	1707	1709
			Std. Deviation	14.7227	15.7059	16.3031

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
3	Total	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	57.9170	57.0756	59.0245
			N	1220	1219	1218
			Std. Deviation	14.5000	16.0621	16.7103
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	60.3892	59.8411	59.5628
			N	1318	1316	1318
			Std. Deviation	14.9907	15.9758	16.4754
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	58.4662	57.2773	55.3399
			N	198	198	198
			Std. Deviation	13.8902	14.0880	15.8943
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	60.3496	59.7073	62.6056
			N	341	341	341
			Std. Deviation	13.7799	15.4380	15.7537
		Total	Mean	59.2809	58.5644	59.4151
			N	3077	3074	3075
			Std. Deviation	14.6395	15.8869	16.5152
4	1 year	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	49.5324	50.8294	51.7338
			N	68	68	68
			Std. Deviation	18.3691	18.5461	18.0926
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	54.7563	53.5438	53.6172
			N	64	64	64
			Std. Deviation	15.8425	17.2878	16.1457
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	59.0250	69.0188	59.8313
			N	16	16	16
			Std. Deviation	17.2241	18.1564	14.7597
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	67.0600	66.6600	62.1400
			N	15	15	15
			Std. Deviation	16.3867	10.7699	13.8974
		Total	Mean	54.1282	55.1374	54.2258
			N	163	163	163
			Std. Deviation	17.7400	18.4159	16.8901

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
4	2 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	58.5793	61.2914	60.5362
			N	58	58	58
			Std. Deviation	16.4136	18.7819	16.6777
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	56.5474	62.8667	58.6632
			N	57	57	57
			Std. Deviation	15.8564	15.3476	13.7415
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	66.0500	72.0083	66.0583
			N	12	12	12
			Std. Deviation	9.2981	17.6416	12.6898
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	58.6667	59.3833	59.6333
			N	6	6	6
			Std. Deviation	9.7334	19.3055	12.6088
		Total	Mean	58.3865	62.8474	60.1910
			N	133	133	133
			Std. Deviation	15.5117	17.3652	14.9621
	3 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	53.7147	58.7824	58.5559
			N	34	34	34
			Std. Deviation	17.2333	16.4516	14.7638
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	52.4868	54.6184	56.2658
			N	38	38	38
			Std. Deviation	14.6338	16.2134	14.3489
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	66.7167	69.6500	69.4000
			N	6	6	6
			Std. Deviation	4.7927	12.3814	6.7264
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	61.2467	64.0733	63.6533
			N	15	15	15
			Std. Deviation	18.9319	18.6800	16.3021
		Total	Mean	55.2667	58.6355	59.1419
			N	93	93	93
			Std. Deviation	16.3373	16.8417	14.7518

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
4	4 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	56.6147	58.3368	59.6676
			N	68	68	68
			Std. Deviation	13.8046	15.0972	13.5866
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	58.1456	63.0176	62.4088
			N	68	68	68
			Std. Deviation	15.8706	17.3812	13.1838
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	62.9429	60.4000	63.8429
			N	7	7	7
			Std. Deviation	14.0457	10.7415	11.6053
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	56.3432	63.0664	60.5629
			N	132	131	132
			Std. Deviation	14.7983	15.6469	12.9208
		Total	Mean	57.0240	61.8124	60.8815
			N	275	274	275
			Std. Deviation	14.7878	15.9178	13.1006
	5 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	51.9006	57.4693	57.4058
			N	514	514	514
			Std. Deviation	15.1002	15.8160	14.9855
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	56.7701	62.9858	61.9904
			N	758	755	758
			Std. Deviation	15.7875	17.0837	14.3377
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	57.2275	65.6100	60.3712
			N	80	80	80
			Std. Deviation	16.8816	17.9358	14.7909
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	58.7636	68.2636	63.3530
			N	66	66	66
			Std. Deviation	16.0054	15.8053	13.5066
		Total	Mean	55.1236	61.3765	60.3006
			N	1418	1415	1418
			Std. Deviation	15.7933	16.9114	14.7203

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
4	Total	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	52.7208	57.2992	57.3907
			N	742	742	742
			Std. Deviation	15.6547	16.4129	15.3984
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	56.5560	62.0420	61.0618
			N	985	982	985
			Std. Deviation	15.7603	17.1797	14.5181
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	59.1413	66.5942	61.5124
			N	121	121	121
			Std. Deviation	15.9492	17.3418	14.1906
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	58.0868	64.7399	61.6252
			N	234	233	234
			Std. Deviation	15.5556	15.7920	13.3270
		Total	Mean	55.5115	60.9160	59.8430
			N	2082	2078	2082
			Std. Deviation	15.8518	17.0156	14.7973
5	1 year	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	51.1077	50.2481	48.6019
			N	52	52	52
			Std. Deviation	17.7123	17.9963	15.4554
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	56.8639	53.8389	54.7167
			N	36	36	36
			Std. Deviation	14.0411	14.5873	11.2956
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	60.2250	55.7625	52.7875
			N	8	8	8
			Std. Deviation	17.4416	17.2118	11.9829
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	63.8000	62.1875	60.9375
			N	8	8	8
			Std. Deviation	17.7416	22.1116	19.6272
		Total	Mean	54.7779	52.8337	51.9894
			N	104	104	104
			Std. Deviation	16.7735	17.2401	14.5682

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
5	2 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	60.2796	58.1633	59.2143
			N	49	49	49
			Std. Deviation	16.8512	16.2036	13.4690
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	61.7800	58.8900	59.4050
			N	20	20	20
			Std. Deviation	15.2471	11.7676	10.5490
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	56.4000	67.1500	56.4500
			N	2	2	2
			Std. Deviation	8.3439	27.9307	9.1217
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	56.5444	58.3889	59.5111
			N	9	9	9
			Std. Deviation	12.3494	11.4176	10.7741
		Total	Mean	60.1375	58.5950	59.2263
			N	80	80	80
			Std. Deviation	15.7255	14.7616	12.2479
	3 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	58.9371	56.5514	56.4029
			N	35	35	35
			Std. Deviation	12.8616	11.1177	13.8003
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	61.6476	63.3810	63.8762
			N	21	21	21
			Std. Deviation	18.6946	15.7557	14.3937
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	54.5333	58.4333	49.6333
			N	3	3	3
			Std. Deviation	11.8593	4.6058	5.3594
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	56.3583	55.5667	51.4167
			N	12	12	12
			Std. Deviation	16.2997	10.5551	13.5415
		Total	Mean	59.1169	58.4845	57.4845
			N	71	71	71
			Std. Deviation	15.1694	12.6331	14.2523

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
5	4 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	57.1515	55.5152	57.6606
			N	33	33	33
			Std. Deviation	16.0367	13.1140	12.0331
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	56.1562	54.3000	54.6875
			N	16	16	16
			Std. Deviation	15.2444	15.3460	16.0706
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	81.8333	60.7000	68.1000
			N	3	3	3
			Std. Deviation	14.9373	20.5874	12.8172
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	64.8400	62.5636	63.5855
			N	55	55	55
			Std. Deviation	15.8042	11.9310	13.3070
		Total	Mean	61.6467	59.1019	60.5542
			N	107	107	107
			Std. Deviation	16.4208	13.3990	13.7021
	5 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	51.2572	54.0662	54.1429
			N	334	334	333
			Std. Deviation	14.3706	12.5256	11.8587
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	53.0984	57.7032	57.2173
			N	186	186	185
			Std. Deviation	17.3731	13.5707	13.7186
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	46.0600	58.8000	54.1179
			N	40	39	39
			Std. Deviation	19.8751	19.1839	19.1126
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	57.7959	55.5102	61.5449
			N	49	49	49
			Std. Deviation	16.0243	10.5538	14.7094
		Total	Mean	52.0043	55.5988	55.6784
			N	609	608	606
			Std. Deviation	16.0080	13.3175	13.3972

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
5	Total	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	53.0417	54.3386	54.4528
			N	503	503	502
			Std. Deviation	15.3221	13.6036	12.8000
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	55.0254	57.5219	57.4083
			N	279	279	278
			Std. Deviation	16.9952	13.9456	13.5117
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	50.8232	58.7455	54.5273
			N	56	55	55
			Std. Deviation	20.4208	18.2336	17.2230
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	60.8556	59.0286	61.3008
			N	133	133	133
			Std. Deviation	16.0421	12.3844	14.3237
		Total	Mean	54.5541	56.1471	56.2467
			N	971	970	968
			Std. Deviation	16.4451	13.9589	13.6928
Total	1 year	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	54.5337	49.6100	52.7668
			N	412	412	410
			Std. Deviation	17.8427	18.2276	16.5943
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	56.7732	49.8996	53.6812
			N	463	461	462
			Std. Deviation	17.5663	18.8247	16.6494
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	56.8038	53.3276	52.4276
			N	106	105	105
			Std. Deviation	19.3015	21.3998	19.0457
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	63.2724	55.5449	61.1286
			N	98	98	98
			Std. Deviation	16.9486	18.4440	17.9991
		Total	Mean	56.5114	50.6374	53.8889
			N	1079	1076	1075
			Std. Deviation	17.9290	18.8998	17.1385

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
Total	2 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	58.4812	52.2648	57.7191
			N	648	645	648
			Std. Deviation	16.7926	18.6658	16.1024
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	58.6121	50.6824	56.2436
			N	638	636	637
			Std. Deviation	16.9390	19.0177	15.5217
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	58.4009	52.2645	54.7927
			N	110	110	110
			Std. Deviation	16.0440	19.2275	17.5109
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	60.1249	52.0432	57.1402
			N	169	169	169
			Std. Deviation	16.8294	19.6104	16.0678
		Total	Mean	58.7064	51.5956	56.8498
			N	1565	1560	1564
			Std. Deviation	16.7967	18.9501	15.9772
	3 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	61.5549	53.3833	59.8332
			N	1287	1287	1286
			Std. Deviation	16.0830	18.0384	15.7549
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	62.6231	52.1583	58.0870
			N	1336	1334	1336
			Std. Deviation	15.5854	17.3291	14.7600
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	59.4729	50.7839	53.8181
			N	207	205	204
			Std. Deviation	15.2539	16.3140	15.0127
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	62.9915	55.1380	60.1939
			N	363	363	363
			Std. Deviation	17.3881	19.9843	17.0034
		Total	Mean	62.0302	52.9035	58.7579
			N	3193	3189	3189
			Std. Deviation	15.9961	17.8992	15.5213

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
Total	4 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	61.1288	58.2778	62.0419
			N	1125	1125	1125
			Std. Deviation	15.6082	16.6619	17.0109
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	62.9435	57.8410	62.0513
			N	1199	1199	1197
			Std. Deviation	15.8492	17.2537	17.5460
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	59.9113	55.5206	58.8966
			N	204	204	204
			Std. Deviation	15.8674	18.7416	17.9324
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	61.6494	61.2672	63.6609
			N	601	600	601
			Std. Deviation	15.2114	16.0643	16.0607
		Total	Mean	61.8448	58.5040	62.1515
			N	3129	3128	3127
			Std. Deviation	15.6642	16.9796	17.1279
	5 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	54.1682	56.3062	57.1841
			N	1686	1685	1684
			Std. Deviation	15.0924	15.4748	15.6089
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	57.7189	60.6089	60.3106
			N	1832	1826	1830
			Std. Deviation	15.7604	16.4220	15.1880
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	54.9626	59.1643	55.7201
			N	270	269	269
			Std. Deviation	15.9110	16.5681	15.6429
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	58.3926	60.9907	62.0917
			N	204	204	204
			Std. Deviation	15.0508	15.5498	15.2093
		Total	Mean	56.0673	58.7111	58.7715
			N	3992	3984	3987
			Std. Deviation	15.5514	16.1241	15.5015

Table C-6 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Aprenda Scores Total Reading	2000 Aprenda Scores Total Math	2000 Aprenda Scores Total Language
	Total	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	58.1005	54.9656	58.6216
			N	5158	5154	5153
			Std. Deviation	16.2433	17.2300	16.2936
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	60.0869	55.8725	59.1131
			N	5468	5456	5462
			Std. Deviation	16.2322	17.8566	15.9839
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	57.7681	54.8719	55.5096
			N	897	893	892
			Std. Deviation	16.3023	18.2335	16.8091
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	61.4572	58.1982	61.6199
			N	1435	1434	1435
			Std. Deviation	16.1307	17.9861	16.4466
		Total	Mean	59.2874	55.6999	58.9470
			N	12958	12937	12942
			Std. Deviation	16.2749	17.6761	16.2663

Table C-7: 2000 Reading, Math, and Language Mean NCE Scores on the Stanford 9 in English for Students Initially Classified as LEP Compared by Grade and by Program Type: Developmental Bilingual Education (DBE), Two-way Bilingual Immersion (TWBI), and Transitional Bilingual Education (TBE) Comparison Groups for the DBE and TWBI Schools, and Native-English Speakers in TWBI: Cross-sectional Analyses

Grade	Program Type		2000 Stanford 9 Scores Total Reading	2000 Stanford 9 Scores Total Math	2000 Stanford 9 Scores Total Language
1	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	51.4572	46.5436	54.7038
		N	1299	1295	1294
		Std. Deviation	18.6156	19.9261	16.0971
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	50.1201	45.0407	53.5558
		N	1345	1333	1338
		Std. Deviation	18.7996	19.6906	17.0087
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	51.9335	45.7631	55.4532
		N	421	420	417
		Std. Deviation	18.5149	18.5175	16.1683
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	59.7694	55.8562	62.0098
		N	457	450	451
		Std. Deviation	21.5026	22.5302	19.5824
	Total	Mean	52.0821	47.0752	55.2956
		N	3522	3498	3500
		Std. Deviation	19.3058	20.3144	17.1404
2	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	47.2957	46.0630	45.1164
		N	1191	1188	1182
		Std. Deviation	15.8951	19.1398	18.0844
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	47.9107	47.5964	48.5620
		N	1295	1292	1291
		Std. Deviation	15.9014	20.1912	19.3006
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	44.6787	41.9761	44.9048
		N	394	393	394
		Std. Deviation	17.1522	19.6490	19.7116
	Native-English Speakers Attending Two-way Bilingual Immersion	Mean	57.5184	53.6842	58.7211
		N	38	38	38
		Std. Deviation	12.9498	13.6060	14.7539
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	54.8858	58.2150	55.4286
		N	386	386	385
		Std. Deviation	18.1620	22.0271	21.2001
	Total	Mean	48.2290	47.6873	47.8070
		N	3304	3297	3290
		Std. Deviation	16.5362	20.3598	19.4139

Table C-7 (continued)

Grade	Program Type		2000 Stanford 9 Scores Total Reading	2000 Stanford 9 Scores Total Math	2000 Stanford 9 Scores Total Language
3	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	46.8474	53.0816	47.6715
		N	1321	1317	1316
		Std. Deviation	17.6882	19.6833	19.0116
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	46.9206	51.6522	48.0914
		N	1358	1355	1353
		Std. Deviation	18.6043	20.5008	19.5262
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	48.8865	53.7643	48.1484
		N	444	442	444
		Std. Deviation	18.7805	21.9420	19.2980
	Native-English Speakers Attending Two-way Bilingual Immersion	Mean	65.8800	69.5967	69.1100
		N	30	30	30
		Std. Deviation	14.1449	16.5149	15.2319
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	54.0088	60.5657	55.3062
		N	420	417	419
		Std. Deviation	19.8735	20.0701	19.2941
	Total	Mean	48.1302	53.6380	48.9691
		N	3573	3561	3562
		Std. Deviation	18.6212	20.5277	19.4753
4	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	44.7178	54.0053	55.4040
		N	1429	1424	1426
		Std. Deviation	17.9294	18.9547	20.6005
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	43.9464	52.0675	55.4516
		N	1385	1378	1381
		Std. Deviation	18.8751	18.9877	20.4285
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	44.3711	52.4333	52.2992
		N	512	511	511
		Std. Deviation	20.1267	20.2073	20.4759
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	52.6397	60.7963	59.5440
		N	438	438	436
		Std. Deviation	20.8163	19.5602	22.1084
	Total	Mean	45.3076	53.8724	55.4807
		N	3765	3752	3755
		Std. Deviation	19.1168	19.3863	20.7703

Table C-7 (continued)

Grade	Program Type		2000 Stanford 9 Scores Total Reading	2000 Stanford 9 Scores Total Math	2000 Stanford 9 Scores Total Language
5	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	41.4439	50.0821	48.4162
		N	1692	1691	1689
		Std. Deviation	18.3043	18.9326	18.6513
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	41.3561	50.8365	47.9061
		N	1930	1928	1929
		Std. Deviation	19.8144	19.0149	19.1780
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	38.9000	47.3245	45.7448
		N	387	387	386
		Std. Deviation	19.3490	19.7297	18.1527
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	51.2908	58.8591	54.5109
		N	457	457	457
		Std. Deviation	23.8238	21.1976	21.0283
	Total	Mean	42.1931	51.0676	48.5888
		N	4466	4463	4461
		Std. Deviation	19.9190	19.4764	19.2046
Total	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	45.7090	50.0163	50.0674
		N	7156	7139	7131
		Std. Deviation	18.1344	19.4830	18.9899
	LEP Group Attending Developmental Bilingual Education (DBE)	Mean	45.5812	49.6043	50.4621
		N	7391	7363	7369
		Std. Deviation	18.8421	19.7612	19.3905
	Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	45.8505	48.5782	49.5245
		N	2158	2153	2152
		Std. Deviation	19.3471	20.5228	19.2909
	Native-English Speakers Attending Two-way Bilingual Immersion	Mean	60.9188	60.6116	63.2464
		N	69	69	69
		Std. Deviation	14.1264	16.7351	15.6279
	LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	54.5321	58.8406	57.4266
		N	2158	2148	2148
		Std. Deviation	21.2122	21.1616	20.8544
	Total	Mean	46.7364	50.7346	51.0456
		N	18932	18872	18869
		Std. Deviation	19.1360	20.1240	19.5404

Table C-8
2000 Reading, Math, and Language Mean NCE Scores on the Stanford 9 in English for Students Initially Classified as LEP Compared by Grade, Program Type, and Number of Years Attending Program: DBE, TWBI, and Comparison Groups in TBE: Quasi-Longitudinal Analyses

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Stanford 9 Scores Total Reading	2000 Stanford 9 Scores Total Math	2000 Stanford 9 Scores Total Language
1	1 year	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	48.9080	48.6440	51.4480
			N	25	25	25
			Std. Deviation	16.4539	21.6696	17.0343
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	44.5400	38.4733	46.5000
			N	15	15	15
			Std. Deviation	20.0403	18.8028	10.6268
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	46.3333	44.9556	50.7778
			N	9	9	9
			Std. Deviation	19.6683	18.4636	16.4598
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	51.2818	46.1545	48.2818
			N	11	11	11
			Std. Deviation	18.6798	15.7245	15.7009
		Total	Mean	47.8650	45.0917	49.5300
			N	60	60	60
			Std. Deviation	17.9674	19.4868	15.0921
	2 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	52.5523	43.2462	50.8031
			N	65	65	64
			Std. Deviation	19.1053	17.9982	14.3077
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	46.1207	40.0982	49.0526
			N	58	57	57
			Std. Deviation	19.9973	20.8721	16.5202
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	51.0750	41.7813	57.6250
			N	16	16	16
			Std. Deviation	21.8184	21.9412	21.0696
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	61.0944	61.5000	62.3278
			N	18	17	18
			Std. Deviation	20.4138	18.4967	17.1946
		Total	Mean	51.0051	43.9394	52.2019
			N	157	155	155
			Std. Deviation	20.2154	20.3879	16.6850

Table C-8 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Stanford 9 Scores Total Reading	2000 Stanford 9 Scores Total Math	2000 Stanford 9 Scores Total Language
1	3 years (PK-Grade 1)	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	50.2236	45.6371	53.1429
			N	140	140	140
			Std. Deviation	18.0818	18.8734	14.9013
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	48.4136	47.1709	53.5029
			N	103	103	103
			Std. Deviation	16.0639	21.0956	15.3772
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	49.5216	42.0588	53.5333
			N	51	51	51
			Std. Deviation	17.7219	17.8536	16.4509
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	54.9815	52.6962	58.4654
			N	27	26	26
			Std. Deviation	19.8859	21.0292	19.5382
		Total	Mean	49.9315	46.1341	53.7534
			N	321	320	320
			Std. Deviation	17.5623	19.7166	15.7067
2	1 year	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	40.8348	44.0391	37.0391
			N	23	23	23
			Std. Deviation	14.9374	14.4303	15.7244
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	39.1278	38.7556	42.1000
			N	18	18	18
			Std. Deviation	14.3632	19.7639	14.7775
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	33.6750	31.2125	32.6500
			N	8	8	8
			Std. Deviation	16.4478	11.9281	7.5631
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	52.2143	75.1429	60.2857
			N	7	7	7
			Std. Deviation	10.7797	10.4291	8.0510
		Total	Mean	40.6857	44.3964	40.9446
			N	56	56	56
			Std. Deviation	14.9997	19.7501	15.6583

Table C-8 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Stanford 9 Scores Total Reading	2000 Stanford 9 Scores Total Math	2000 Stanford 9 Scores Total Language
2	2 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	56.8583	61.1458	61.8958
			N	24	24	24
			Std. Deviation	17.3804	20.6688	21.2877
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	51.4833	57.2833	45.8500
			N	18	18	18
			Std. Deviation	10.0656	17.0826	17.6388
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	39.5375	38.5250	35.5875
			N	8	8	8
			Std. Deviation	12.3873	12.1433	9.9062
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	51.4000	55.2750	56.0125
			N	8	8	8
			Std. Deviation	14.2002	18.8883	19.8732
		Total	Mean	52.0483	56.0172	52.4759
			N	58	58	58
			Std. Deviation	15.0859	19.3891	20.7175
	3 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	51.3642	51.3642	48.9962
			N	53	53	53
			Std. Deviation	13.4578	16.9867	16.3723
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	46.3771	44.0854	43.4125
			N	48	48	48
			Std. Deviation	14.6925	19.0202	16.0313
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	51.1000	45.7111	50.5222
			N	9	9	9
			Std. Deviation	19.0640	20.8951	21.3492
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	62.2333	66.7267	59.3400
			N	15	15	15
			Std. Deviation	19.9741	25.4350	20.1149
		Total	Mean	50.7344	50.0056	48.2032
			N	125	125	125
			Std. Deviation	15.8047	20.2201	17.5914

Table C-8 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Stanford 9 Scores Total Reading	2000 Stanford 9 Scores Total Math	2000 Stanford 9 Scores Total Language
2	4 years (PK-Grade 2)	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	45.3752	44.2115	42.9107
			N	113	113	112
			Std. Deviation	15.7780	20.3329	17.1711
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	45.5352	46.3133	47.1610
			N	105	105	105
			Std. Deviation	13.6216	18.4761	17.0524
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	41.3625	44.3562	43.9187
			N	16	16	16
			Std. Deviation	15.7255	19.0486	22.2583
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	55.0143	62.1321	54.7929
			N	28	28	28
			Std. Deviation	16.3621	19.0048	17.5544
		Total	Mean	46.2244	46.9779	45.9571
			N	262	262	261
			Std. Deviation	15.2614	20.0050	17.7769
3	1 year	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	39.4560	52.1440	42.0080
			N	25	25	25
			Std. Deviation	21.0231	19.7813	24.1565
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	36.6826	43.8435	40.1565
			N	23	23	23
			Std. Deviation	19.3363	21.8010	19.9116
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	42.4500	59.5375	39.1250
			N	8	8	8
			Std. Deviation	12.8119	16.1919	9.0122
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	38.3167	53.7667	47.0167
			N	6	6	6
			Std. Deviation	20.1875	35.9989	22.5204
		Total	Mean	38.7032	50.1758	41.4339
			N	62	62	62
			Std. Deviation	19.0946	22.1618	20.6878

Table C-8 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Stanford 9 Scores Total Reading	2000 Stanford 9 Scores Total Math	2000 Stanford 9 Scores Total Language
3	2 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	50.3381	60.6095	53.0810
			N	21	21	21
			Std. Deviation	20.7947	18.1821	20.2603
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	56.6000	59.9583	55.6083
			N	12	12	12
			Std. Deviation	14.4916	18.4843	15.3769
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	55.9000	71.3000	35.9000
			N	2	2	2
			Std. Deviation	9.8995	8.0610	10.8894
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	61.5000	83.5375	63.6375
			N	8	8	8
			Std. Deviation	14.5943	13.1915	16.0738
		Total	Mean	54.4209	65.1907	54.9512
			N	43	43	43
			Std. Deviation	17.8350	19.0175	18.3523
	3 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	54.2971	64.0941	55.1618
			N	34	34	34
			Std. Deviation	17.2523	20.5111	20.9694
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	49.5350	60.0050	52.7250
			N	20	20	20
			Std. Deviation	18.5133	22.4562	17.2388
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	54.0429	63.6429	57.2143
			N	14	14	14
			Std. Deviation	12.5901	24.2043	14.0266
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	55.8467	67.6733	62.1067
			N	15	15	15
			Std. Deviation	15.4030	18.7225	20.2495
		Total	Mean	53.3867	63.6795	56.1759
			N	83	83	83
			Std. Deviation	16.4310	21.0989	18.8935

Table C-8 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Stanford 9 Scores Total Reading	2000 Stanford 9 Scores Total Math	2000 Stanford 9 Scores Total Language
3	4 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	49.1785	59.7443	52.3177
			N	79	79	79
			Std. Deviation	17.4033	21.1829	19.4758
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	52.0974	58.1092	54.4526
			N	76	76	76
			Std. Deviation	17.5756	20.6811	19.0280
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	53.1625	68.0812	57.7063
			N	16	16	16
			Std. Deviation	22.1542	24.8852	22.0197
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	47.1375	59.1167	49.6333
			N	24	24	24
			Std. Deviation	14.6571	19.5341	14.1777
		Total	Mean	50.3918	59.7138	53.2615
			N	195	195	195
			Std. Deviation	17.5584	21.1119	18.9203
	5 years (PK-Grade 3)	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	43.8358	53.0157	47.7804
			N	179	178	179
			Std. Deviation	17.1470	20.3673	18.6189
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	41.3230	48.1261	42.1304
			N	139	138	138
			Std. Deviation	15.2515	17.8596	16.5862
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	51.6000	58.7864	49.1386
			N	44	44	44
			Std. Deviation	19.0507	25.1420	17.3884
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	49.1889	54.8778	48.0444
			N	9	9	9
			Std. Deviation	14.9530	17.3485	24.7986
		Total	Mean	43.9450	51.9206	45.8411
			N	371	369	370
			Std. Deviation	16.8950	20.2608	18.0643

Table C-8 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Stanford 9 Scores Total Reading	2000 Stanford 9 Scores Total Math	2000 Stanford 9 Scores Total Language
3	Total	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	46.2169	56.1193	49.4858
			N	338	337	338
			Std. Deviation	18.1049	20.7051	19.7864
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	45.2478	51.9914	46.8320
			N	270	269	269
			Std. Deviation	17.4193	20.0793	18.5200
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	51.5357	61.7357	50.8476
			N	84	84	84
			Std. Deviation	18.0711	23.8686	17.8731
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	50.5419	63.2048	53.9742
			N	62	62	62
			Std. Deviation	16.2733	21.7873	19.1740
		Total	Mean	46.8180	55.8543	49.0592
			N	754	752	753
			Std. Deviation	17.8106	21.2345	19.1564
4	1 year	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	27.0348	45.4696	40.1000
			N	23	23	23
			Std. Deviation	18.6412	22.0427	23.7555
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	29.5455	50.3900	50.2200
			N	11	10	10
			Std. Deviation	19.4675	19.2344	15.7715
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	39.9200	62.7600	51.5800
			N	5	5	5
			Std. Deviation	12.1265	17.2254	13.1298
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	60.6500	82.2750	76.3000
			N	4	4	3
			Std. Deviation	15.8855	11.9299	19.7654
		Total	Mean	32.3023	52.2048	46.6171
			N	43	42	41
			Std. Deviation	20.1224	22.5686	22.3594

Table C-8 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Stanford 9 Scores Total Reading	2000 Stanford 9 Scores Total Math	2000 Stanford 9 Scores Total Language
4	2 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	36.3952	55.1619	51.2048
			N	21	21	21
			Std. Deviation	19.6912	24.3276	21.3004
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	41.1333	62.2083	54.7167
			N	12	12	12
			Std. Deviation	15.6828	18.4597	18.1123
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	39.7667	56.0667	55.6167
			N	6	6	6
			Std. Deviation	15.7846	17.5739	20.3976
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	41.6750	60.7250	48.9750
			N	4	4	4
			Std. Deviation	12.6597	19.1820	28.8677
		Total	Mean	38.6791	57.7721	52.5930
			N	43	43	43
			Std. Deviation	17.1906	21.0807	20.3919
	3 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	48.6156	60.5200	61.4111
			N	45	45	45
			Std. Deviation	16.5122	19.1000	23.6168
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	45.2216	56.9784	62.0459
			N	37	37	37
			Std. Deviation	19.6383	16.1480	20.8145
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	54.3938	64.0938	64.8438
			N	16	16	16
			Std. Deviation	15.7013	22.2272	17.9594
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	49.2946	60.3351	56.5541
			N	37	37	37
			Std. Deviation	11.6522	14.7538	20.1175
		Total	Mean	48.5563	59.9222	60.6607
			N	135	135	135
			Std. Deviation	16.2635	17.5575	21.2564

Table C-8 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Stanford 9 Scores Total Reading	2000 Stanford 9 Scores Total Math	2000 Stanford 9 Scores Total Language
4	4 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	51.5473	61.0485	64.9456
			N	169	169	169
			Std. Deviation	13.9999	16.7485	17.2014
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	45.2789	56.6074	59.2862
			N	109	108	109
			Std. Deviation	15.8284	14.0760	16.5971
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	48.8075	62.7225	55.4325
			N	40	40	40
			Std. Deviation	14.7237	13.2507	17.2546
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	42.0111	50.8667	49.6278
			N	18	18	18
			Std. Deviation	18.2427	20.6034	17.9983
		Total	Mean	48.6768	59.2696	61.1565
			N	336	335	336
			Std. Deviation	15.2148	15.9939	17.5421
	5 years	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	42.0873	55.9948	54.6314
			N	331	330	331
			Std. Deviation	14.5806	17.4261	18.1952
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	37.9353	48.4828	51.2907
			N	204	204	204
			Std. Deviation	16.5755	19.0018	18.9090
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	35.9805	49.9524	44.6841
			N	82	82	82
			Std. Deviation	15.4214	17.4130	14.9600
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	51.5455	56.8273	59.8909
			N	11	11	11
			Std. Deviation	21.0034	19.4188	23.2522
		Total	Mean	40.1068	52.7751	52.3395
			N	628	627	628
			Std. Deviation	15.7077	18.2960	18.4211

Table C-8 (continued)

Grade	Number of Student Years in Program–from Sept.95 to June 2000	Program Type		2000 Stanford 9 Scores Total Reading	2000 Stanford 9 Scores Total Math	2000 Stanford 9 Scores Total Language
4	Total	Non-DBE LEP Comparison Group Attending Transitional BE	Mean	44.5097	57.3522	57.4192
			N	589	588	589
			Std. Deviation	15.9697	18.1010	19.5860
		LEP Group Attending Developmental Bilingual Education (DBE)	Mean	40.6595	52.1906	54.7849
			N	373	371	372
			Std. Deviation	17.1319	17.8552	18.7648
		Non-TWBI LEP Comparison Group Attending Transitional BE	Mean	41.6859	55.5752	50.4060
			N	149	149	149
			Std. Deviation	16.5565	17.9350	17.3492
		LEP Group Attending Two-way Bilingual Immersion (TWBI)	Mean	48.0595	58.7176	55.7452
			N	74	74	73
			Std. Deviation	15.6330	18.0699	20.7841
		Total	Mean	43.1644	55.5936	55.6042
			N	1185	1182	1183
			Std. Deviation	16.5182	18.1388	19.2514

Table C-9

1999-2000 Reading, Math, and Language Mean NCE Scores on the Stanford 9 in English for LEP Students Attending Schools with TBE or DBE Services but Placed in the English Mainstream Classes Because Parents Refused Bilingual/ESL Services: Cross-sectional Analyses

Grade		1999-2000 Stanford 9 Scores Total Reading	1999-2000 Stanford 9 Scores Total Math	1999-2000 Stanford 9 Scores Total Language
1	Mean	48.1922	44.2844	52.3173
	N	359	358	358
	Std. Deviation	17.3534	18.9817	16.0695
2	Mean	45.8349	47.4636	46.2824
	N	335	335	335
	Std. Deviation	15.7681	19.4577	18.0266
3	Mean	45.1583	53.0533	47.0656
	N	420	418	418
	Std. Deviation	17.7797	19.6529	18.8693
4	Mean	42.8323	52.7265	53.9726
	N	325	325	325
	Std. Deviation	17.8282	18.6377	20.1757
5	Mean	35.8764	47.6834	42.3748
	N	301	301	301
	Std. Deviation	19.2699	20.8123	19.0975
6	Mean	25.0833	36.4750	30.3208
	N	24	24	24
	Std. Deviation	15.4452	18.1328	16.5965
Total	Mean	43.6188	49.0032	48.2290
	N	1764	1761	1761
	Std. Deviation	18.1350	19.8090	18.9705

Table C-10

1999-2000 Reading, Math, and Language Mean NCE Scores on the Stanford 9 in English for LEP students Attending Schools with TBE or DBE Services but Placed in the English Mainstream Classes Because Parents Refused Bilingual/ESL Services, by Type of School: **Cross-sectional Analyses**

Type of School	Grade		1999-2000 Stanford 9 Scores Total Reading	1999-2000 Stanford 9 Scores Total Math	1999-2000 Stanford 9 Scores Total Language
Schools with TBE and Mainstream Classes Located in Same Neighborhood of DBE Schools	1	Mean	48.7048	43.7139	52.9494
		N	166	166	166
		Std. Deviation	17.7951	17.8719	14.8742
	2	Mean	49.7793	50.4000	48.5496
		N	135	135	135
		Std. Deviation	17.8574	20.8121	19.9437
	3	Mean	45.0419	54.3926	47.6696
		N	191	190	191
		Std. Deviation	18.2937	20.3216	20.0710
	4	Mean	46.1314	54.7286	56.4895
		N	105	105	105
		Std. Deviation	19.5480	20.2919	22.9077
	5	Mean	30.2889	41.6374	36.4061
		N	99	99	99
		Std. Deviation	17.1028	17.4240	16.6735
	6	Mean	25.6118	36.2529	29.7765
		N	17	17	17
		Std. Deviation	15.6330	18.2601	16.9248
	Total	Mean	44.4404	48.9888	48.3738
		N	713	712	713
		Std. Deviation	19.2548	20.1509	19.9471

Table C-10 (continued)

Type of School	Grade		1999-2000 Stanford 9 Scores Total Reading	1999-2000 Stanford 9 Scores Total Math	1999-2000 Stanford 9 Scores Total Language
Schools with DBE and Mainstream Classes	1	Mean	46.5021	43.5201	50.0264
		N	144	144	144
		Std. Deviation	15.6429	20.0821	16.3824
	2	Mean	43.8399	46.5625	45.6679
		N	168	168	168
		Std. Deviation	13.2641	18.5033	16.5218
	3	Mean	44.2759	51.4700	46.5968
		N	191	190	189
		Std. Deviation	16.9894	18.2814	17.6395
	4	Mean	40.2000	50.7261	52.8168
		N	184	184	184
		Std. Deviation	16.3403	17.5646	18.8053
	5	Mean	39.0703	50.5924	46.0174
		N	172	172	172
		Std. Deviation	20.0912	21.8998	19.9036
	6	Mean	23.8000	37.0143	31.6429
		N	7	7	7
		Std. Deviation	16.1254	19.2552	17.0037
	Total	Mean	42.4961	48.7437	48.0759
		N	866	865	864
		Std. Deviation	16.9090	19.4580	18.1836
Schools with TBE and Mainstream Classes Located in Same Neighborhood of TWBI Schools	1	Mean	51.7625	48.5500	57.0042
		N	48	48	48
		Std. Deviation	20.2790	19.1550	18.1176
	2	Mean	40.2452	40.6677	40.8097
		N	31	31	31
		Std. Deviation	14.8498	15.6231	15.1272
	3	Mean	50.1789	54.2737	46.3605
		N	38	38	38
		Std. Deviation	18.6843	22.6429	18.9632
	4	Mean	46.6639	57.1111	52.5389
		N	36	36	36
		Std. Deviation	18.0734	18.0598	18.2136
	5	Mean	36.0033	50.9567	41.1867
		N	30	30	30
		Std. Deviation	17.4806	20.9965	17.1965
	Total	Mean	45.8962	50.4820	48.5792
		N	183	183	183
		Std. Deviation	18.9636	20.0327	18.6721

Table C-11

1999-2000 Reading, Math, and Language Mean NCE Scores on the Aprenda 2 in Spanish for Native-English Speakers Attending Two-way Bilingual Immersion Program: Cross-sectional Analyses

Native-English Speakers in Two-way Bilingual Immersion	Grade		1999-2000 Aprenda 2 Scores Total Reading	1999-2000 Aprenda 2 Scores Total Math	1999-2000 Aprenda 2 Scores Total Language
	2	Mean	58.5667	50.8833	55.1833
		N	6	6	6
		Std. Deviation	32.7709	33.1351	33.2525
	3	Mean	62.8273	59.6000	61.2273
		N	11	11	11
		Std. Deviation	18.6158	19.4133	21.9598
	4	Mean	60.2700	61.5400	59.9300
		N	10	10	10
		Std. Deviation	17.7285	14.6389	17.4733
	5	Mean	74.0133	70.2800	67.9000
		N	15	15	15
		Std. Deviation	12.1752	11.0660	13.4977
	Total	Mean	65.6048	62.6310	62.4381
		N	42	42	42
		Std. Deviation	19.4224	18.9480	20.0559

Table C-12

1999-2000 Reading, Math, and Language Mean NCE Scores on the Stanford 9 in English for Native-English Speakers Attending Two-way Bilingual Immersion Program: **Cross-sectional Analyses**

Native-English Speakers in Two-way Bilingual Immersion	Grade		1999-2000 Stanford 9 Scores Total Reading	1999-2000 Stanford 9 Scores Total Math	1999-2000 Stanford 9 Scores Total Language
	2	Mean	57.5184	53.6842	58.7211
		N	38	38	38
		Std. Deviation	12.9498	13.6060	14.7539
	3	Mean	65.8800	69.5967	69.1100
		N	30	30	30
		Std. Deviation	14.1449	16.5149	15.2319
(Test scores not yet available for Grades 4-5)					
	Total	Mean	60.9188	60.6116	63.2464
		N	68	68	68

Findings from an Inner City Research Site in the Northwest U.S.

The Regional Social Context

Schools in the northwest U.S. have in the recent past experienced a different type of homogeneous community than that described in the northeast U.S. francophone context along the Canadian border. Until the 1980s, or in some cases 1990s, many school districts in the states of Washington, Oregon, and Idaho served mostly students of European-American descent. Many whites in this region are descendants of the pioneers who crossed the country in the great waves of emigration from the eastern U.S. states, during the middle 1800s. In addition, Seattle has a significant Asian-American population, with its bustling international trade with countries around the Pacific Rim. Asian-Americans increased in number with the end of the Vietnam war and Indochinese refugees' relocation in all parts of the U.S. including the Northwest. Native American groups in this region live mostly in isolated rural areas.

Before the 1980s, Hispanics served by the schools were mostly from families of migrant workers serving as seasonal laborers who returned to Mexico after the crops were harvested. However, beginning in the 1980s and especially during the 1990s, a new demographic pattern gradually emerged in these three states of the Northwest. Hispanics started to settle in larger and larger numbers in permanent communities, no longer returning to their mother country. Economic hardship, war in El Salvador, and political repression in various regions of Mexico and Central America, as well as the political climate in California (where several anti-immigrant initiatives were passed by voters in the 1990s), have driven many Hispanic families to seek work in other regions of the U.S., leading to increasing numbers of Hispanics settling and seeking permanent residency in the Northwest. Hispanics of Mexican and Central American descent now represent the largest minority group in many Northwest communities, and schools are struggling to provide appropriate and meaningful curricular assistance for these new arrivals. Since this phenomenon is the recent experience of many small towns and cities across the U.S., we thought it appropriate to include in our "story" of schools across the U.S. the example of one school in the northwest region that has chosen to respond to this challenge in some unique ways.

Initially, the school district in which this school is located had planned to participate in our study. But because of a new computer system and other technical difficulties with archival data retrieval under the old system, it was decided that there was not sufficient available data to provide a meaningful longitudinal analysis at that point in time. However, one of the schools with a large number of Hispanic students had collected a sufficient amount of data in computer-readable form, so that we can include the student achievement results from this school in this report. This school was also the district's early adopter and successful implementer of innovative strategies for educating language minority students.

Grant Community School is a public inner city school located in the heart of Salem, Oregon (population 107,800), near the state capitol buildings as well as the state prison. This is a high-needs school, designated as such by the school district because lower incomes, higher crime rates, fewer two-parent households, and multicultural diversity characterize its neighborhood. The school currently serves a student population of whom 93.6 percent are from families in poverty (on free and reduced lunch), with a 71 percent annual mobility rate among students. The highest mobility is mainly among white families, due to family circumstances in which one family member may be incarcerated and housing is temporary while the family lives near the prison. This is the situation for approximately 34 percent of the students attending Grant Community School, according to the principal. Students also come from the Women's Crisis Center and the Salvation Army Homeless Shelter. The two largest Section 8 apartment housing projects for the city of Salem are located within Grant Community School's attendance area.

Spanish speakers are the largest language group entering the school district, with average annual increases of 16-20 percent in recent years. In the school year 2000-2001, the total number of students in the school district was 33,783. Of this number, 3,360, or 9.9 percent, were classified as limited in English proficiency. Grant Community School has experienced an even greater increase each year in the proportion of Spanish speakers than that of the school district as a whole. As an example of this steady growth in the Hispanic population, in 1987-88, the Grant student population for Grades K-6 consisted of only 17 Hispanics (5 percent of the total) and 310 students of Euro-American descent, with 60 percent of the students on free (53%) or reduced (7%) lunch. By 2000-2001, Grant had expanded its grade levels served to Grades PK-8, with a total student population of 608, 42 percent of whom are of Spanish-speaking background, with 87 percent of the students on free or reduced lunch.

Statewide Context for the Innovation

Since increasing numbers of immigrants settling in Oregon is a phenomenon of recent years, school programs to serve newly arrived students with little or no proficiency in English are also relatively new, having been developed over the past one or two decades. Bilingual schooling for migrant workers' children are the longest established education services in the state for linguistically and culturally diverse students.

The large majority of school districts have hired certified English as a Second Language (ESL) teachers to serve the new immigrants, because until recently the number of students of each language group were not sufficient to offer bilingual instruction. Some of these ESL programs provide mostly ESL pullout services, and others in schools with larger numbers of immigrant students offer ESL content classes. During the 1990s, some school districts across the state of Oregon hired increasing numbers of certified bilingual teachers, to provide instruction for students in their primary language. Most of the services provided by the bilingual staff are transitional bilingual programs, providing support for 1-2 years for students to develop basic literacy in first language (L1) and to provide some content instruction (math, science, social studies) in L1 while students work on English acquisition. But the main focus in transitional programs is to acquire English and move the students into all-English instruction as soon as possible.

A few schools in Oregon decided that they needed to do still more. In each case, it took a committed principal to develop the innovation and to make sure that the innovation was sustained. The two-way dual language model was pioneered by Grant school, beginning in 1994-95, and it has become the showcase for the state, for those principals who are ready to create this model for school reform. Grant Community School regularly receives visitors who are preparing to implement this model, many of whom are educators in the Northwest region.

Implementation of the School Innovation

In the late 1980s, before there were larger numbers of Hispanic students attending what was then Grant Elementary School (K-6), many issues needed to be addressed at this school serving mostly low-income families, according to surveys of students, parents, and staff. Students (23 percent) expressed concerns that they did not feel safe on the playground, and 49 percent felt that students at Grant School didn't care about each other. Student/staff relations needed improvement according to the surveys; 28 percent of students in the primary grades felt that adults at Grant School did not like them, and 35 percent of students in the intermediate grades sometimes felt "put down" by the Grant staff. In 1990, Grade 4, 5, and 6 students scored at the 27th, 14th, and 32nd percentiles respectively in reading achievement on the Iowa Tests of Basic Skills. First-offense disciplinary infractions increased from 44 to 75 incidents of student fighting between years 1985 and 1989. The school community wanted a change.

School-community partnerships. Beginning in 1989, Grant Elementary School began what became a decade-long effort that continues to this day, to enhance relationships among staff and students, and to foster closer home-school partnerships. Staff inservice training first focused on conflict resolution, positive action, cooperative learning, and consistent implementation of building-wide rules. Teachers have taken ongoing courses to improve students' reading, writing, science, social studies, and math development and teachers' use of authentic assessment. Over the past decade, teachers have also worked together regularly to develop integrated thematic units for mixed-age classes, and an instructional resource center houses the instructional artifacts to support the thematic units developed, using community knowledge and resources.

Parents come to school for "Lunch Bunch" as well as after school hours for a community/ parent nurturing program, volunteer reading partners, a parent literacy project, a parent video and resource library, family nights, parenting classes, family health fair, and the child health initiative. The number of programs and services taking place in the school building after school hours and on weekends make the building accessible to the whole community for lifelong learning. Business partners have been cultivated to provide extra support for materials and resources. A preschool program was added to the school in 1995-96 to address needs of the younger children of the community.

Two-way dual-language enrichment schooling. By the early 1990s, increasing numbers of Spanish-speaking children were enrolling at Grant School. The staff began to recognize that they needed to provide some services in Spanish. As the principal sought help with what types of services might be provided, by attending national conferences sponsored by the U.S. Department of Education and professional organizations, he became convinced that his school had the appropriate demographics to implement a two-way model of bilingual education. He wanted a positive school environment, for every child at the school to experience success in learning. In 1992,

> we designed and developed the engines of governance for an inclusive dual language two-way immersion program in which all students become bilingual and biliterate. There are many rationales that support this growing movement advocating the creation of inclusionary schools. If we are to become a neighborhood known by the school it keeps, we must become a nurturing community. That is to say, categorical segregation of any subgroup of people is simply a violation of civil rights and the principle of 'equal citizenship.'
>
> (Foster, 1999, p. 1)

The vision became a passion. By including the Spanish speakers in their curricular plan, thus using the bilingual and bicultural resources and knowledge of the community in all classes, they ended up creating a curriculum that extended the English speakers' knowledge as well, and thus stimulated higher academic achievement for all, especially important in a high-poverty school with student achievement in the lowest third of the rankings on nationally normed tests.

Initially, only a few teachers were involved in the experiment. In 1994-95, the school began offering bilingual classes in Spanish-English for Grades K-1, following a 50-50 model for instructional time in each language. With the help of Title VII U.S. Department of Education funding the following year, the program then became a comprehensive school model, adding one grade each year until all grades and all classes K-6 were taught bilingually. With Spanish-speakers' enrollment increasing each year, the 50-50 balance of English speakers and Spanish speakers in each class that is suggested as a research "ideal" (Lindholm-Leary, 2001) has become closer and closer to being a reality. As of school year 2000-2001, Spanish speakers represented 42 percent of Grant Community School's population, providing same-age peers for all grades for the process of enhancing second language acquisition. In other words, English-speaking students serve as peer teachers during the instructional time conducted in English, and Spanish-speaking students are peer teachers for the instructional time in Spanish.

As students in the lower grades built increasing proficiency in their second language and the program was extended grade by grade, the feeder middle school did not express interest in developing a continuation of the program. With total support from the community and school board, Grant School was given funding to build a new wing (completed in 2001) to house the middle school continuation of curricular modules taught through both Spanish and English, so that the school now houses Grades PK-8, with all classes taught through a dual language model of schooling. This is a somewhat unique neighborhood two-way bilingual school, serving its own geographic community that surrounds the school; most other two-way bilingual schools in the region are magnet schools.

Balance of the two languages of instruction. To carry out the goal of 50 percent of the instruction in each language, all grades and blends (2 grade levels covered by one team of teachers for two years) are team taught by one English-speaking and one Spanish-speaking teacher. The teachers are organized into "families" that include bilingual instructional assistants, with each family consisting of the teachers who teach adjacent grade levels and need to plan carefully together. Spanish and English instruction are always kept separate, allowing for maximum concentration in the language of instruction. The teacher rarely translates or code-switches. Two teachers who are teaming might share two classes of 30 students each (approximately half of whom are English speakers and half Spanish speakers), alternating the time to work with each class.

For first and second grade students, immersion in the second language occurs every other day.

For students in Grades 3, 4, and 5, all instruction is in English for one week followed by a week of instruction in Spanish. The middle school Grades 6, 7, and 8 alternate the two languages by block scheduling, with equal time devoted to each language of instruction. Blocks consist of science/math, language arts/social studies, and visual/performing arts, with technology integrated throughout the curriculum, all taught through integrated thematic units. The kindergarten teachers have gradually increased time in Spanish with each succeeding year of implementation of the program, moving towards more of a 90-10 model for that grade, since the teachers all agree that students need more work in Spanish at the start of the program, to build students' strong proficiency in each language. English, the dominant language, is strongly supported outside of school, so the minority language, Spanish, needs more support during the school day, especially when students first begin the program.

A third language for middle school students. A new initiative that began during the 2000-2001 school year added development of a third language for the students at middle school level who were ready to tackle this challenge. The language choices to be offered will be German and Japanese. German was introduced this past year, and Japanese will be taught through a partnership with Tokyo International University, which houses a branch of the university in Salem, Oregon. The new teacher, who is a native speaker from Germany, commented, "It is amazing to see how easily these bilingual students acquire German. I enjoy their ability to pronounce words almost like native Germans."

Teacher credentials. The staff hired by the principal of Grant Community School are highly trained for their task, all having completed much more than the coursework required for mainstream teachers. All 14 teachers have mainstream teacher certification to teach the grade levels they are teaching. In addition, 11 have completed bilingual teacher certification and 9 have completed ESL teacher certification. Some of the English-speaking team teachers have completed a Spanish endorsement, to add to their knowledge and use of Spanish with the children and parents in social contexts outside of the classroom.

Many of the added resource staff of the school as well as the school secretaries are proficiently bilingual in Spanish/English. Six of the teachers and several of the support staff and instructional aides are Hispanic, making ethnicity of the school staff comparable to the proportion of Hispanic students. Nine of the teachers are deeply proficient in both Spanish and English and capable of providing instruction for their grade level in either language. The whole school has created an additive bilingual environment where both languages are celebrated and affirmed.

The principal of the school has strong Native American ancestry, of Chickasaw, Chiricahua Apache, and Cherokee roots, as well as some German and Irish ancestry. His own experiences growing up in an inner city and his doctoral coursework in education heavily influence his dedicated style of school leadership. His strong empathy and caring for every student in the school as well as all staff and the students' families are evident in the long hours he spends at the school, there to meet all needs. What is most unusual about this school is the camaraderie that is present among the teaching staff. The principal and several teachers and their families live in the school neighborhood and participate actively in school and community events. The teachers support each other in many ways, professionally and socially. Weekly staff planning time is built into the schedule, and teachers take seriously the extensive planning that must take place for teaming to work.

One of the innovations to provide more planning time for the teachers was created by the staff and community. By adding extra time to the school day on Monday through Thursday of each week, the school celebrates Fantastic Fridays, when students experience special planned events, sponsored by parents and community members. On Friday afternoons, elective classes are provided by 30-35 community volunteers, with a wide variety of choices for students, such as use of computers, games, sports, drama, puppeteering, Ballet Folklórico, and various arts. This gives teachers planning time on Friday afternoons to map out their plans for the following week, developed in their "family" units. Fantastic Fridays won an award as Outstanding Volunteer Program of the Year from the school district in 1998.

Teaching style. Our survey of teaching practices revealed the following patterns among the teaching staff of Grant school. All of the teachers except one stated that they adhere very strictly to the principle that they conduct all instruction only in one language; no translation takes place in the conversation from teacher to student. At the same time, all teachers (except one at the middle school level) allow students to use both languages as needed. This practice is deemed necessary because of the unusually high mobility rate of the students, especially among the English speakers. As students leave and return to the school, they miss important instruction in Spanish and thus they need their peers to assist them with the lessons, to catch up again.

A crucial principle of this school, confirmed by the teacher surveys, is that all students are integrated together all day every day. There is never any time when one group of students is pulled out of the classroom for special remedial instruction. ESL is not taught as a separate subject. Instead, Spanish speakers and English speakers are working together, acquiring the curriculum through their two languages. This is a very strong inclusion model.

Almost all of the teachers (13 of the 14) stated that they make major use of their jointly planned thematic units, implemented through cooperative learning, whole language, multicultural literature, hands-on instructional materials, discovery learning, authentic assessment, stimulation of multiple intelligences, and use of art, music, and drama. One of the teachers is a bilingual songwriter and musician who develops new songs for each thematic unit, written in all the varying musical styles of the U.S. and Latin America. The teachers also acknowledged that they all work hard to connect the curriculum to students' life experiences as well as their bilingual/bicultural knowledge, and sometimes make use of community and parents' knowledge as a resource for student learning. Seven of the teachers working with older students say that they use critical pedagogy in their curricular explorations with students.

Several teachers and resource staff are working with extracurricular activities attended by many students. The school's Ballet Folklórico (35 students) has performed traditional Mexican dances at numerous school and civic events. The school soccer teams have competed and sometimes won in regional tournaments. El Club Chapulín has provided additional assistance to Spanish speakers entering the upper grades who have had little prior education, as well as additional Spanish instruction for late-enrolling English speakers. Sister relationships with schools in Mexico have led to trips to Baja California, for students, parents, and staff to visit Spanish-speaking contexts for continuing bilingual/bicultural family exchanges and knowledge acquisition. Parents participate in numerous bilingual/bicultural school events, such as literacy fairs, family literacy nights (at which parents have shared their "Living Stories–Cuentos Vivientes"), ESL/SSL nights for parents to teach each other their mutual languages, classes for improving parent skills with homework assistance, and family enrichment nights.

Summary of Social Context and Implementation Findings

Grant Community School, through the vision of the staff and the community, has created a unique, innovative public school "that encourages students, staff, parents and other community members to be creative, lifelong learners" (Grant School Vision Statement). The two-way bilingual program has become integral to the whole school, Grades PK-8, and serves the needs of the community at all levels and for all ages. The school has full community support and school board support at the school district level.

The following guiding principles for this school have evolved in staff meetings, as the principal and teachers working together have gradually shaped an enrichment bilingual school, and as they affirm what they see happening to students in their school:

- The degree of children's native language proficiency is a strong predictor of their English language development.
- The knowledge that children get through their first language helps make the English they hear and read more comprehensible, which results in increased English acquisition.
- Literacy development in the native language transfers to the second language.
- Development of academic/subject matter proficiency in a second language takes from four to seven years. The more education a student has in his/her native language, the faster and better he/she will be able to acquire academic English.
- Second language acquisition is a complex process that is not only linguistic and cognitive, but is also affected by cultural factors.
- The primary goal for language-diverse students is the acquisition of English.
- The student's first language is valued as a resource in the learning process, and fluency and literacy in the student's first language is a priority.
- All students can benefit from the acquisition of a second language.
- Staff who work with language-diverse students must be knowledgeable regarding best research practices in the areas of language acquisition and second language teaching strategies.
- Language-diverse students are provided with equal opportunities to learn and have equal access to materials through the application of high standards for success.
- Programs for language-diverse students support District student goals to achieve measurable standards.
- Programs for language-diverse students reflect the needs, resources, demographics, school and family priorities, and best practices within the context of each school.
- The cultural and linguistic heritage of all students is nurtured and respected throughout their public school experience.
- All students can successfully complete high school. Language-diverse students will be supported by programs and services that ensure success.

As the principal of Grant Community School says,

> We are not perfect and we are not yet done. At times it feels as if we have just begun. Our success is not because we hit on the right formula at first shot, but because the participants have examined well researched effective instructional practices, engaged in dialogue, thought things out, and believed it to be so. When students and families experience success, it isn't because of any one person's efforts, but because we are all working together for mutual benefit. (Foster, 1999, p. 1)

The following sections present the quantitative results of our data analyses to date. Grant School has collected some measures of student academic achievement in both Spanish and English.

Results in Student Academic Achievement

We have chosen this high-mobility, low-income neighborhood school to illustrate the process that school staff go through in curricular and assessment decisions, when working with a highly at-risk, diverse student population. The high rate of student mobility, especially among the English-speaking students, has made it very difficult to measure the long-term impact of the program, but the commitment of the staff and community to their dual-language model has gradually led to higher student achievement in comparison to the school's achievement levels of a decade ago, before the program began.

Oral language development. In order to measure students' ongoing development of listening and speaking modes in second language, the teaching staff decided that they wanted to use a performance measure for oral language development of both Spanish and English. The teachers of Grant Community School chose the Student Oral Language Observation Matrix (SOLOM) and were trained in conducting assessments using the matrix for this instrument. The SOLOM measures development of comprehension, fluency, vocabulary, pronunciation, and grammar, using a five-point graduated scale for each category of language development, with a maximum score of 25. Given the variability in student background, the teachers decided to assess both primary language and second language of all students every year, so that they would have ongoing records of student growth in oral use of their two languages.

The results of this assessment show steady growth in development of each of the languages of instruction, with each additional year that students attended the two-way dual-language immersion program. Figure D-1 and Tables D-1 through D-4 present the results of the analyses of the SOLOM data. Native-Spanish speakers made the greatest gains, both in English and in Spanish. When they first enrolled in Grant school, some of the Spanish speakers who had experienced interrupted schooling in home country were behind on vocabulary development for their grade level. By the second year in the program, their Spanish development was closer to grade level and remained there with added years in the program, at a score of 23 to 24.

In English development, the Spanish speakers far outperformed their English-speaking peers in acquisition of their second language. By the end of the first year in the program, Spanish speakers had reached a mid-range in development of oral English, scoring slightly above level 13 and they made steady progress with each additional year in the program, reaching level 20 after five years of schooling. Native-English speakers were assessed as close to grade level in oral English, but they struggled much more with Spanish acquisition. After three years in the program, their oral Spanish began to improve significantly, and after five years of exposure to Spanish half of the instructional time, the native-English speakers had made it to just above level 14 on this performance assessment.

This pattern is very similar to datasets from many other research studies examining bilingual schooling in the U.S. (for a review, see Lindholm-Leary, 2001). It illustrates the difficulty of acquiring the minority language, especially when the majority language–English–has such high status. English is dominant outside of the school setting, as well as inside the school, despite the best efforts of bilingual teachers to equalize the status and instructional time of the two languages. The 90-10 models of bilingual schooling that have been increasingly implemented in the states of California and Texas were first developed to deal with this problem. By increasing the amount of time that both English- and Spanish-speaking students are schooled through the minority language in the early childhood years of Grades K-2, students are better able to work at grade level in both languages when they reach the upper elementary grades and beyond. As seen in our analyses of the findings from the two school districts of Northern Maine and the Houston Independent School District, 90-10 bilingual models of schooling are highly desired, when the ultimate goal is full proficiency in both of the languages of instruction. However, this particular decision to implement a 90-10 rather than a 50-50 bilingual program would not significantly raise Spanish proficiency development levels at Grant School until the school's English-speaking student population becomes less mobile. The bilingual teachers reported that the English speakers who have remained at Grant School throughout their elementary school years have reached very high levels of proficiency in Spanish.

Academic Spanish development. The next assessment decision that the Grant teaching staff needed to make was how they would measure written language development for both of the instructional languages. When the program first started, they tried several instruments that involved extensive staff time to assess students individually. As the program grew and numbers of students in the school increased, almost doubling in size from just one decade ago from 327 to 608 students, the staff chose to use the standardized assessments required by the state for their English measures of written language and academic development.

The bilingual staff chose the Spanish Assessment of Basic Education (SABE), a nationally norm-referenced test, for their academic measure of Spanish and subject knowledge. However, the high mobility of the English-speaking student population meant that few of these students stayed in the program for enough years to reach a level of proficiency in Spanish for the SABE assessments to be meaningful. Since new Spanish-speaking students arrive each year, at all ages and grade levels, the teachers then chose to use the SABE assessment for the newly-arriving Spanish speakers, to measure their grade-level performance across the curriculum. This measure has become an important means of demonstrating that the Spanish-speaking students remain on grade level in academic knowledge while they are acquiring the English language to the level where they can demonstrate what they know through English as well as through Spanish.

Figure D-2 and Tables D-5 and D-6 present the analyses of native-Spanish speakers' performance on the SABE. As can be seen, the Hispanic students who took this test in 1999 and 2000 scored exceptionally high on the reading measure given at 4th, 5th, and 6th grade levels, at the 68th NCE (80th percentile). As stated before, in this report we have chosen the reading subtest in each norm-referenced test as the ultimate level of attainment, because it measures language usage across the curriculum. To do well on this difficult test, students have to be able to apply their knowledge of math, science, social studies, language arts, and literature in problem-solving tasks. To have scored at this high level, these Hispanic students applied both their knowledge from their home country schooling and the knowledge acquired at Grant School since their arrival.

In 2001, the Spanish-speaking groups being tested at mostly 3rd and 4th grade levels reached the 53rd NCE (55th percentile) on the SABE. This performance slightly above grade level is also laudable. Two new arrivals in fifth grade were at the 36th NCE (see Table D-6), indicating some interrupted schooling in the students' past, as confirmed by their parents. This assessment helped to provide the bilingual teachers with information regarding the academic work needed to eventually catch these students up to grade level.

Academic English development. With the standardized assessments now required by the state of Oregon for third and fifth grades, this school has used these state measures to assess all students' academic achievement in English in these two grades. (See Figures D-3 to D-10 and Tables D-7 to D-19 for Grant School's results on these state measures.) In 1990, before implementation of the two-way dual language immersion program at Grant School, with a student body of 95 percent Euro-American and 5 percent Hispanic background, 60 percent of whom were on free or reduced lunch, the 4th graders scored at the 37th NCE (27th percentile), 5th graders at the 28th NCE (14th percentile), and 6th graders at the 40th NCE (32nd percentile) on the reading subtest of the Iowa Tests of Basic Skills, very low achievement in the bottom quartile and third of the national rankings on this standardized test. By 2001, Grant Community School had enrolled double the number of students of the previous decade, 58 percent of whom were of Euro-American and 42 percent of Hispanic background, and 87 percent of whom were on free and reduced lunch, a student population even more highly "at risk" than a decade before. Yet in 2001, the percent of students who met or exceeded the standards in the Oregon Statewide Assessment in Grades 3 and 5 was significantly high for this student population. As can be seen in Tables D-18 and D-19, 74 percent of the native-English-speaking students met or exceeded the standards in English reading and 58 percent in math. Among the Spanish speakers, 58 percent met or exceeded the standards in English reading and 48 percent in math.

Although there are no test-equating studies to assess the Oregon state tests' comparability with the nationally normed Iowa Tests of Basic Skills, the standards on this state test are quite high, normed on a majority-Euro-American English-speaking student population. Compared to statewide performance overall, presented in Tables D-7 and D-12, on the reading assessment the third grade English-speaking students at Grant School were in the 45th percentile and Spanish-speaking students in the 41st percentile of all students in Oregon; while the fifth graders were in the 29th and 14th percentile groups. On the math assessment, the third grade English-speaking students were in the 40th percentile and Spanish-speaking students in the 25th percentile of all students in Oregon; while the fifth graders were in the 36th and 24th percentile groups.

At first glance, fifth grade scores appear to be low achievement. However, the fifth grade scores represent a higher percentage of new students than the third grade scores. This school receives new immigrants every year at all grade levels, and within 1-2 years of their entry year, they take these difficult tests in English. The school also receives new white low-income students each year at all grade levels. So the fifth grade scores represent Spanish-speaking students who have been in the U.S. for one year mixed with those here for five years, as well as low-achieving English speakers just arrived. The small number of Hispanic students at each grade level makes it inappropriate to break these scores down by number of years of exposure to English, so that these scores underestimate these students' actual grade-level knowledge, as more appropriately demonstrated in the SABE results. The fifth grade Spanish-speaking students have not yet had enough years of English to demonstrate what they know on a standardized test in English at the more difficult fifth grade level. This is a common problem in program evaluation at the school level, so we present it here for the benefit of evaluators and researchers reading this report.

Table D-17 presents Grant students' performance, with appropriate comparisons to their comparison groups that met or exceeded state standards in 2001, broken down by ethnic background. Hispanic 3rd graders at Grant reached a significantly higher level of achievement than Hispanic 3rd graders in the school district and state in both reading and math. The fifth grade Hispanic students were below their comparison groups at the school district and state level, but these comparison groups include a larger percentage of settled Hispanics with more proficiency in English, while Grant School has a higher than average mobility rate.

Students of white ethnic background attending Grant School are somewhat lower achieving in both 3rd and 5th grades in comparison to the school district and state averages for their ethnic group (see Table D-17). But even given this group's "at risk" characteristics from low-income families, half of whom have one family member incarcerated in the state prison, approximately two-thirds met or exceeded the state standards on these difficult reading and math tests. This is substantial improvement of this ethnic group's performance at this school in comparison to a decade before. Receiving schooling through two languages in a warm and caring instructional context has resulted in these white low-income students' higher academic achievement, more consistent attendance, greatly reduced number of disciplinary infractions, and increased participation in school events and extracurricular activities, according to interviews with the principal and teachers.

Figures D-3 through D-10 and the accompanying Tables D-8 to D-11 and D-13 to D-16 present the actual scores that individual students at Grant Community School achieved on the Oregon Statewide Assessments in Spring, 2001. These tables and figures are presented by grade, by subject tested, and by student ethnic background. The "cutoff" score is chosen by the state as the level at which a student is deemed to have met state standards for that subject area and that grade level. Grade 3 cutoff score in reading and math is 201 and Grade 5 cutoff score for the two assessments is 215.

In Grade 3 reading, Figures D-3 and D-4 visually demonstrate the very high achievement of both the English- and Spanish-speaking students. Those below the cutoff clustered near the cutoff score, with two exceptions among the English-speaking students, and only three Spanish-speaking students scored below the cutoff. For Grade 5 reading scores, presented in Figures D-5 and D-6, five English-speaking and five Spanish-speaking students were significantly below the cutoff. The others clustered near, at, or above the standards for this state test.

Similar patterns are present in the math scores. For Grade 3 math (Figures D-7 and D-8), the 10 English-speaking students who did not reach the cutoff were very close to that score, with two exceptions. Half of the Spanish-speaking students were below the cutoff, nine of whom were more than five points below. For Grade 5 math scores (Figures D-9 and D-10), four English-speaking and six Spanish-speaking students were more than five points below the cutoff score. These patterns of achievement demonstrate that overall the students of Grant Community School are working towards grade-level performance and reaching higher levels of achievement than that of students attending this school a decade ago.

Hierarchical stepwise regression analyses: Influence of socioeconomic status. Using hierarchical stepwise regression, as described by Cohen and Cohen (1975), we assessed the effects of student socioeconomic status (SES) and years of program exposure on the available measures of student achievement, including the SOLOM (in English and Spanish) and the Oregon Statewide Assessment (in Reading and Mathematics). In this process, each predictor was entered into the regression equation first, and then also entered last in another regression equation. We then noted the change in R^2 as each predictor entered either first (with the presumed maximum effect on R^2 of that predictor) or last (with the presumed minimum effect of that predictor on the criterion variable). We then noted the minimum and maximum values of the change in R^2 for each predictor as a relative indicator of its importance in influencing student achievement outcomes. In addition, each increment in R^2 was tested for statistical significance. Finally, R^2 increments exceeding 5 percent were considered to be of practical, "real-world" significance in cases where small sample size (and the resulting loss of statistical power) resulted in a likely Type II error.

Tables D-20 and D-21 present a summary of the hierarchical linear regression analyses performed. Since the effects of the predictors on the student achievement outcomes could be expected to be different for students whose first language was Spanish, as opposed to English, we analyzed the native-Spanish speakers and native-English speakers separately. For students whose first language was English, the amount of variance in the achievement outcome variables attributable to student SES ranged from 4.1-4.2 percent ($p<.05$) for the SOLOM-English version, 1.8-2.4 percent for the SOLOM-Spanish version, 7.4-10.6 percent ($p>.05$ but practically significant) for the Statewide Assessment in Reading, and 6.0-8.1 percent ($p>.05$ but practically significant) for the Statewide Assessment in Math. However, the effect of the number of years of student participation in the program explained varying amounts of achievement variance, depending on the particular achievement measure. For native English speakers, years in the program accounted for less than 1 percent of their achievement on the SOLOM in English, but accounted for 19.5-20.1 percent ($p<.05$) of their achievement on the SOLOM in Spanish. In addition, years in the program accounted for 5.7-8.8 percent ($p<.05$) of achievement variance for the Statewide Assessment in Reading and 1.9-4.1 percent of variance in the Statewide Assessment in Mathematics.

For students whose first language was Spanish, the variation accounted for by SES was 10.6-11.7 percent ($p<.05$) for the SOLOM in English, 0.2-0.3 percent for the SOLOM in Spanish, 3.0-3.5 percent for the Statewide Assessment in Reading, and 3.4-4.0 percent for the Statewide Assessment in Mathematics. The variable "number of years of program experience" accounted for 14.0-15.1 percent ($p<.05$) of SOLOM (English) variance, 0.8 percent of SOLOM (Spanish) variance, 5.8-6.3 percent ($p>.05$ but practically significant) of the Statewide Assessment in Reading, and 0.7-1.3 percent of the Statewide Assessment in Mathematics.

It is worth noting that the instructional program (as assessed by the number of years of program experience) exerted a powerful and significant effect on SOLOM (English) scores for Spanish speakers, and exceeded the effect of SES for those students. Also, years in the program exerted a powerful and significant effect on SOLOM (Spanish) scores for English speakers, accompanied by a negligible effect of SES. In addition, years in the program affected more than 5 percent of the variation in Statewide Assessment in Reading scores for both Spanish speakers and English speakers, while its effect on Statewide Assessment Math scores tended to be smaller. Taken together, these results indicate that the school's program directly influenced test scores in the second language for both English speakers and Spanish speakers, and also directly influenced student scores on the Statewide Assessment in Reading to a practically significant degree.

When the effect of socioeconomic status on Statewide Assessment in Reading scores is examined for the entire school population, SES accounts for approximately 14 percent of the observed variation overall. Thus, it appears that the school's program is "reversing" the negative effects of SES in its areas of curricular emphasis, including second language acquisition by English and Spanish speakers and mastery of the curriculum as measured by statewide Reading scores in English. These are large and significant program effects, significantly reducing SES effects for these two groups, as described above.

As well, additional investigation indicated that the relationship between the variable "number of years of student participation in the program" and several outcome measures was consistently under-estimated because of the lack of a linear relationship required by the multiple linear regression technique employed. This means that the actual program effect is likely to be even larger than the statistically and practically significant effect found in these analyses, providing potential evidence for the existence of even stronger program effects. Further analyses at a later time will utilize curvilinear regression to investigate this matter further.

Conclusions

For this high-poverty public school with unusual but compelling "at risk" factors indirectly influencing student achievement, this Spanish-English bilingual school is making a big difference in students' and families' lives. The impact on the community is difficult to capture in the academic achievement findings, but interviews with parents have confirmed their satisfaction and pride in their community school. High attendance at evening and weekend events at the school attest to strong community support. This school appears to be serving the needs of not only the students but also the adults of the community.

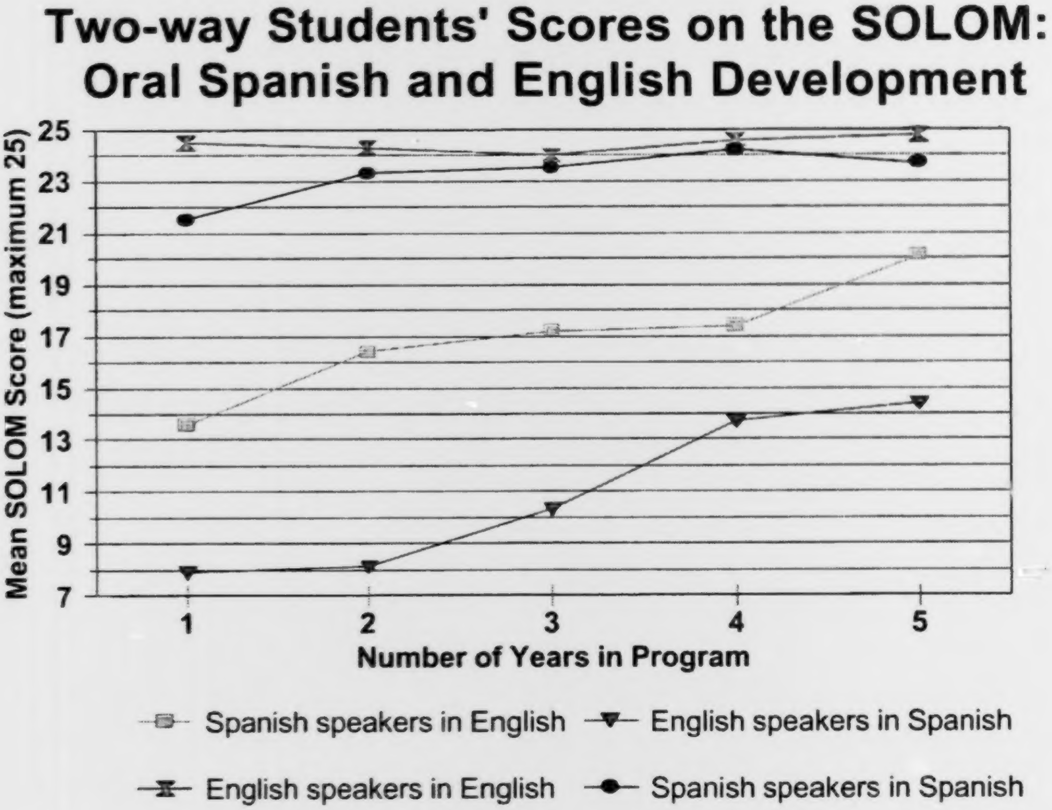
Academic achievement is steadily getting better, for both the native-English-speaking and native-

Spanish-speaking students. Perhaps the most dramatic finding in our research analyses is the impact of the bilingual program on socioeconomic status. The more years that both the native-English and native-Spanish speakers attend this school, the less influence poverty has on their performance on second language acquisition measures as well as on the academic tests of the Oregon Statewide Assessment. Even though family circumstances make it necessary for many of the English-speaking children to come and go or move to a different region, while they are attending the school, the school achievement data demonstrate that the school has made a big difference in their lives. Working half of the instructional year through the medium of the Spanish language has enhanced the students' academic performance, in comparison to the school's achievement levels one decade ago before the bilingual program began. Acquisition of academic Spanish has stimulated intellectual development, at no cost to these students' English development.

This school provides a good example of the process involved in designing and implementing a school innovation with two languages of instruction. As the principal said, "We are not perfect and we are not yet done." Yet this school has done amazing things to involve the whole community in the change process. They have made instructional decisions thoughtfully, through reading the research that informs the field, through staff development sessions to clarify and reach consensus among teachers, and through revisiting decisions when something does not seem to be working well. The staff recognize that they are still working on improving their assessment practices, to better capture the "magic" that they feel is present in their classes. Both native-Spanish-speaking and native-English-speaking students are happy, excited about the work they do in school, and extremely proud of their school. It is a place where students, staff, and families share many varied and deep learning experiences and openly express their caring for each other.

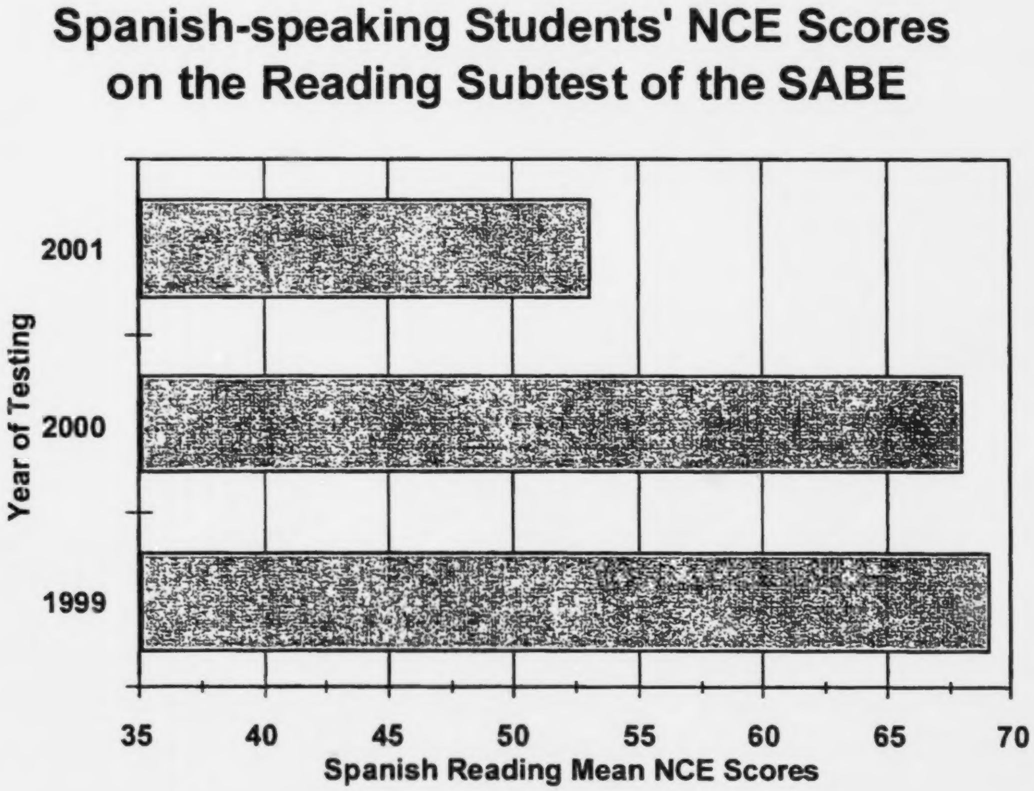
Northwest U.S. Inner City Research Site - Figures

Figure D-1
Quasi-longitudinal analyses



(See Tables D-1 and D-2 for number of students by primary language and by number of years in program)

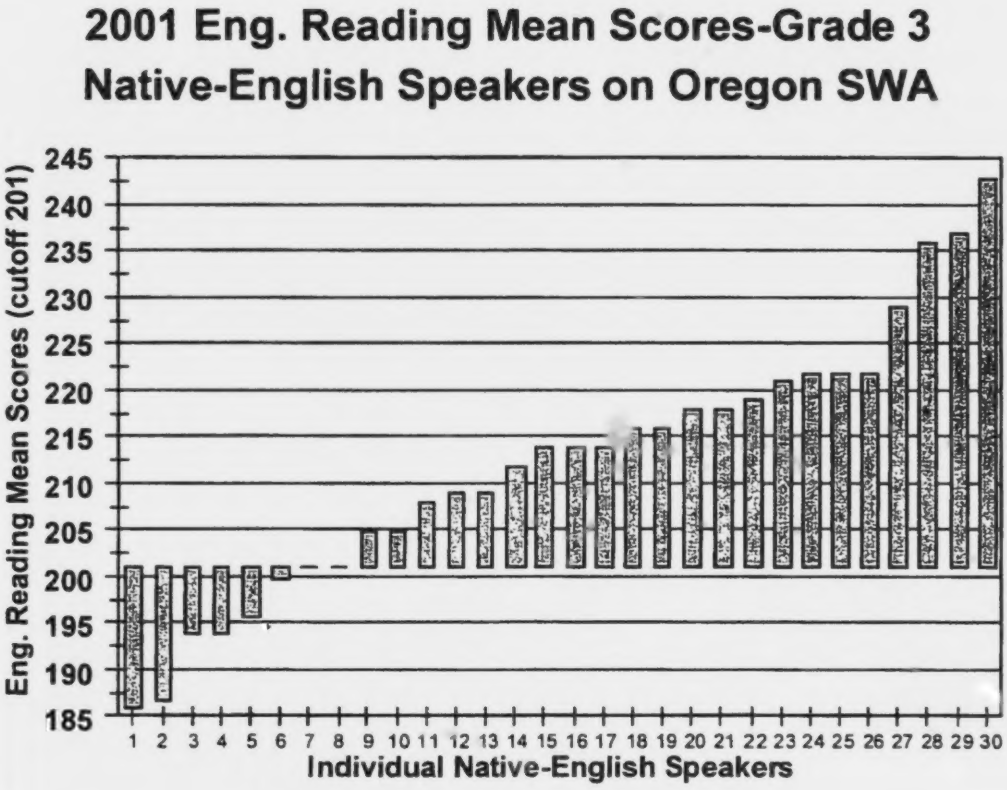
Figure D-2
Cross-sectional analyses



Recent-arriving Spanish-speaking students in Two-way Dual Language Immersion Program who took the Spanish Assessment of Basic Education (SABE) to measure their grade-level knowledge until they were proficient enough in English to take the grade-level measures in English

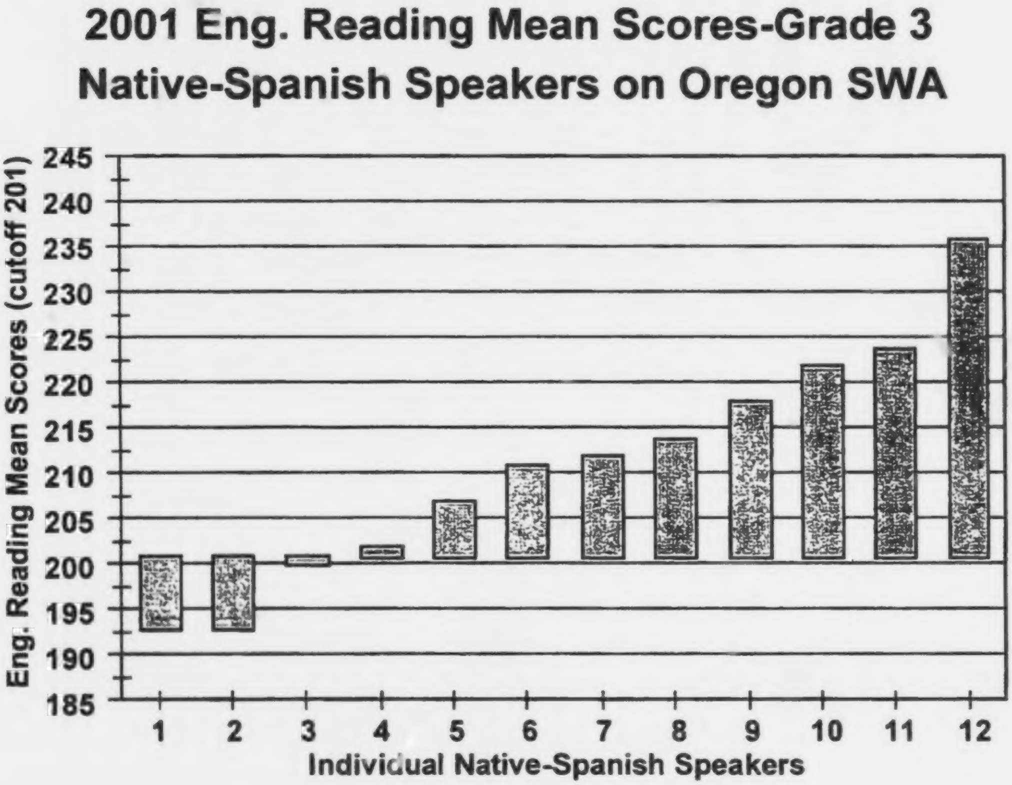
1999 N = 23
2000 N = 25
2001 N = 29

Figure D-3
Oregon Statewide Assessment
Cross-sectional analyses



N = 30

Figure D-4
Oregon Statewide Assessment
Cross-sectional analyses



N = 12

Figure D-5
Oregon Statewide Assessment
Cross-sectional analyses

N = 17

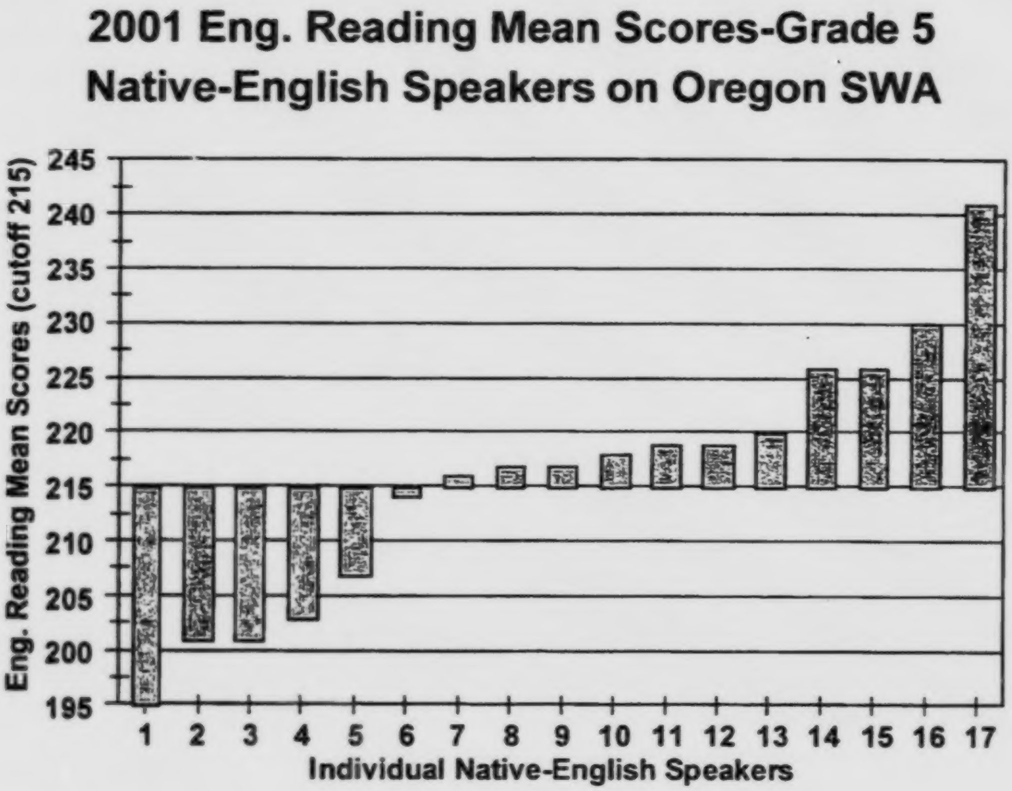


Figure D-6
Oregon Statewide Assessment
Cross-sectional analyses

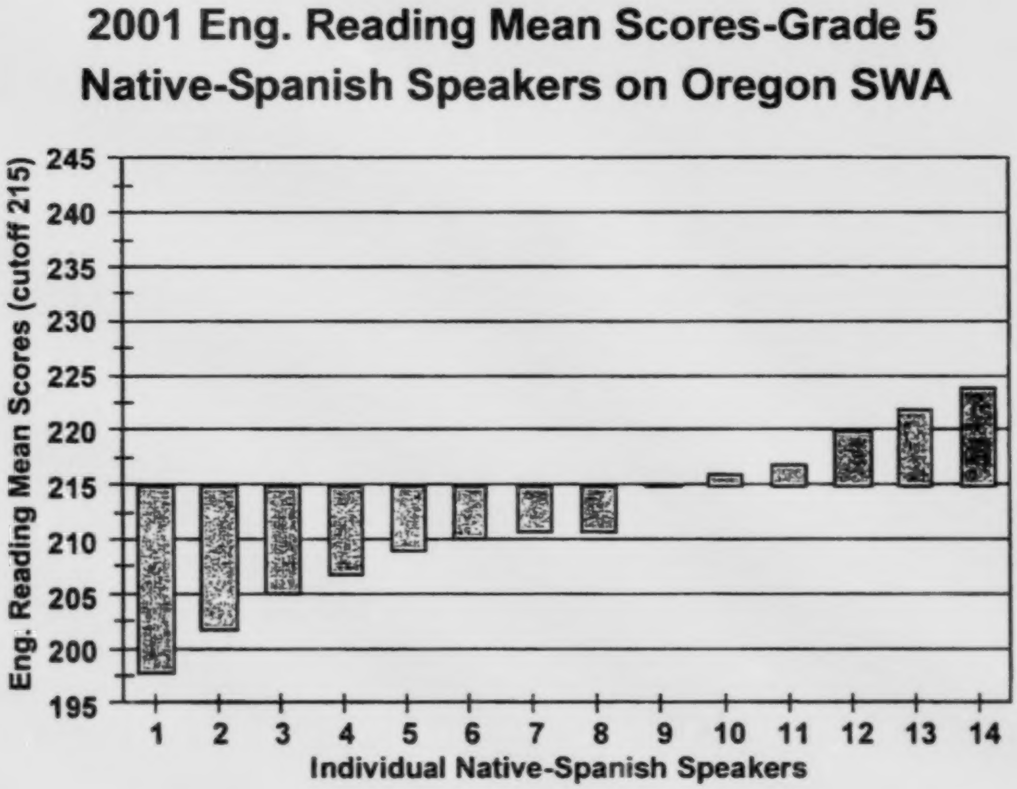


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Figure D-7
Oregon Statewide Assessment
Cross-sectional analyses

2001 Mathematics Mean Scores - Grade 3
Native-English Speakers on Oregon SWA

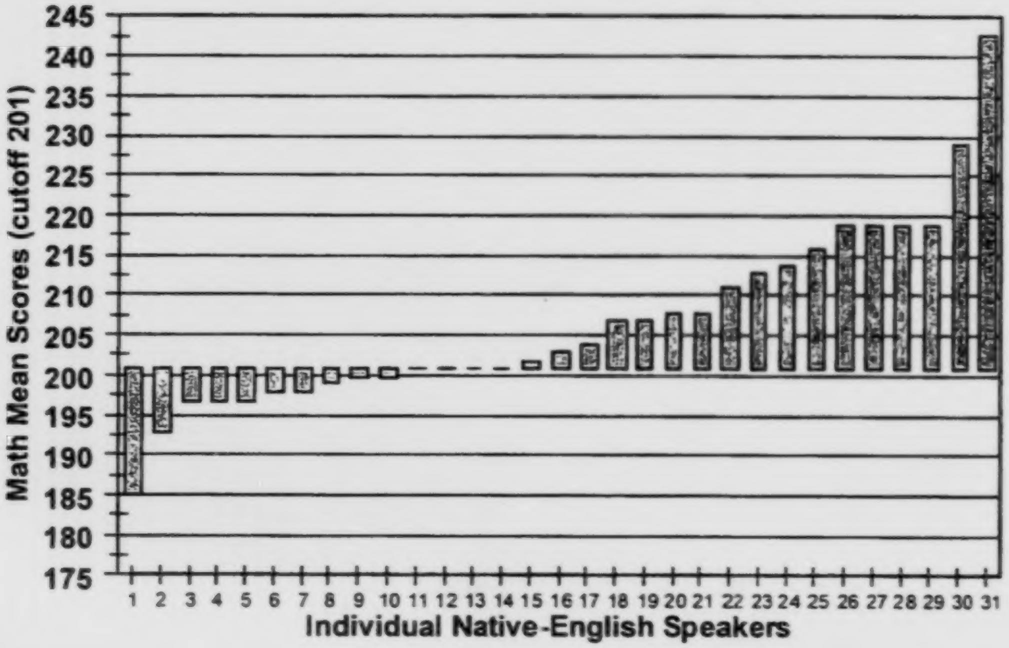

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Figure D-8
Oregon Statewide Assessment
Cross-sectional analyses

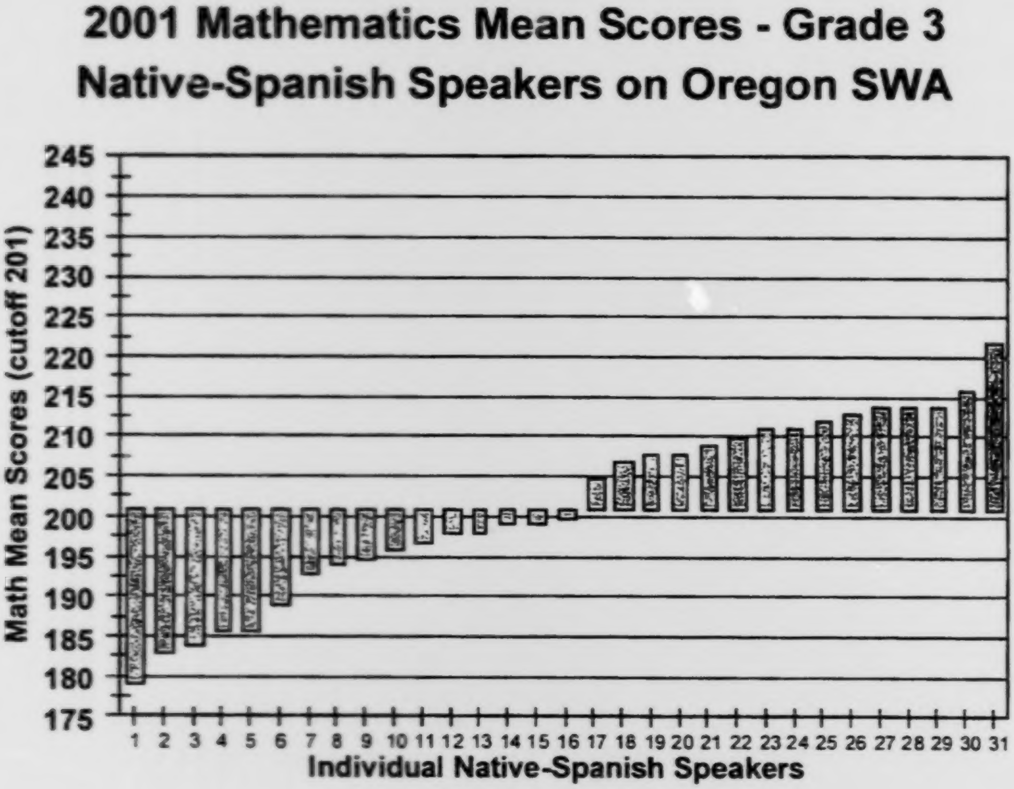

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Figure D-9
Oregon Statewide Assessment
Cross-sectional analyses

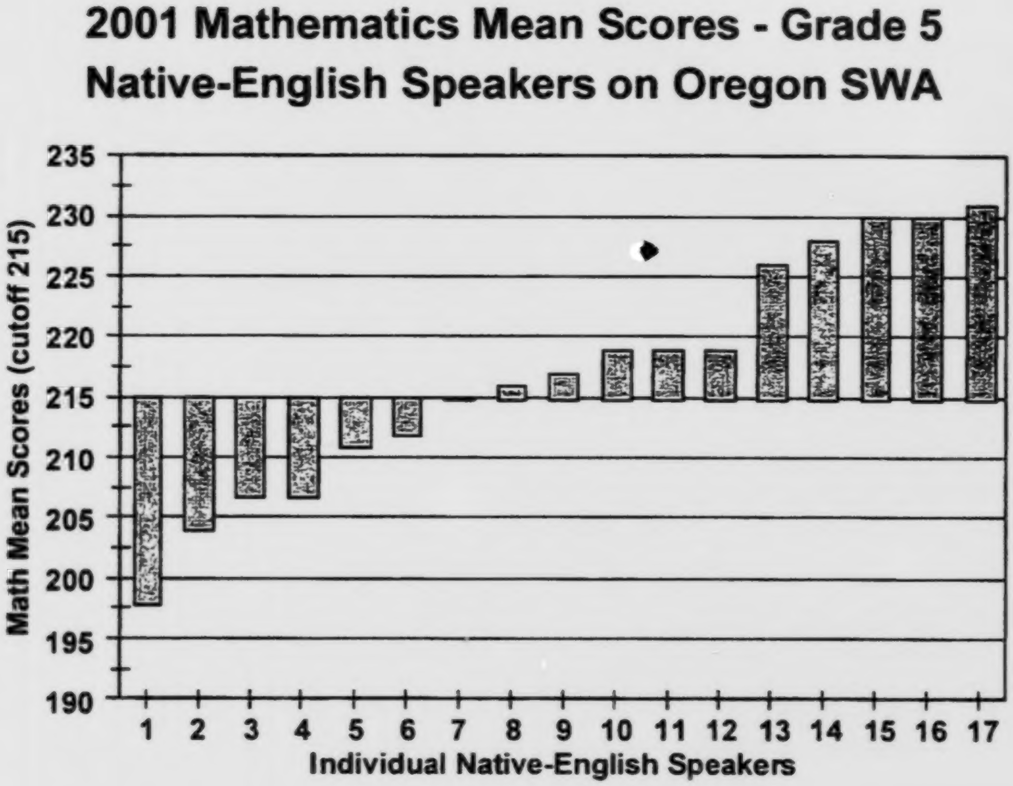

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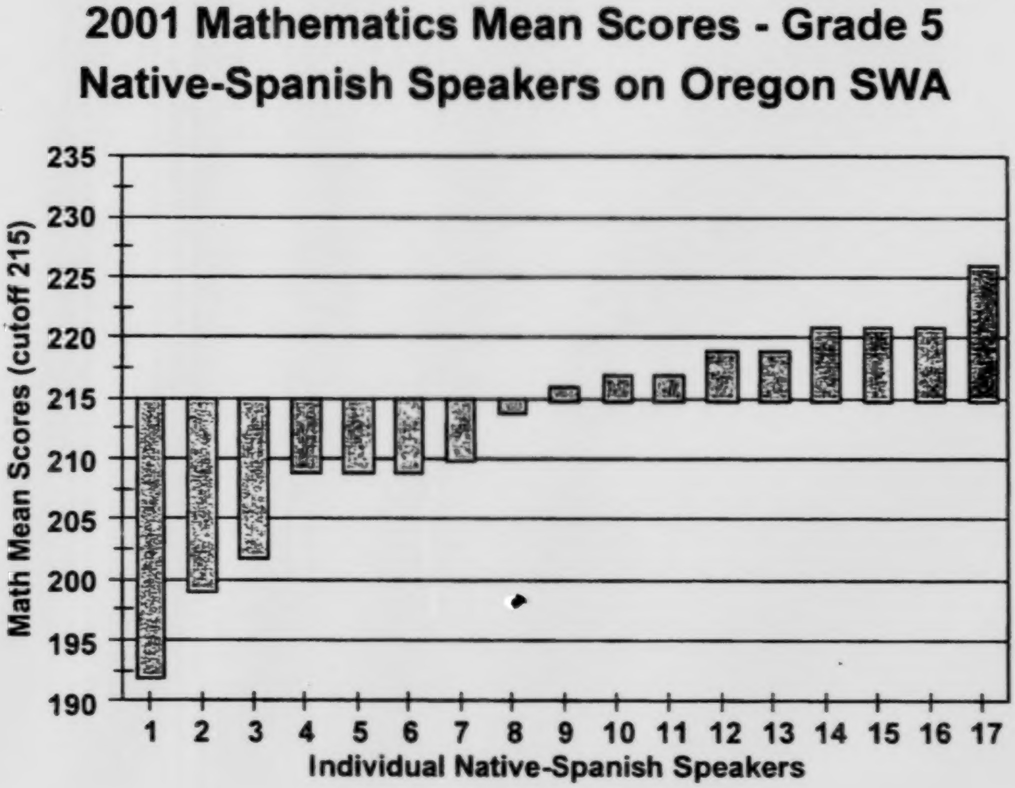
Figure D-10
Oregon Statewide Assessment
Cross-sectional analyses



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Northwest U.S. Inner City Research Site — Tables

Table D-1
1996-2001 English Scores on the Student Oral Language Observation Matrix (SOLOM)
(Measuring Comprehension, Fluency, Vocabulary, Pronunciation, and Grammar)
by Number of Years Attending Two-way Dual Language Immersion Program:
Quasi-longitudinal Analyses

Students' Primary Language	Total Number of Years in Dual Language Immersion Program	Mean Score (Maximum score 25)	Number of Students Tested (N)	Standard Deviation
English	1 year in program	24.49	72	1.81
	2 years in program	24.32	99	2.42
	3 years in program	23.98	62	2.41
	4 years in program	24.57	35	1.44
	5 years in program	24.78	23	1.04
	Total	24.36	291	2.09
Spanish	1 year in program	13.62	55	6.39
	2 years in program	16.42	83	5.13
	3 years in program	17.22	50	5.12
	4 years in program	17.44	27	4.53
	5 years in program	20.09	23	3.32
	Total	16.41	238	5.52
Total	1 year in program	19.78	127	6.97
	2 years in program	20.72	182	5.54
	3 years in program	20.96	112	5.11
	4 years in program	21.47	62	4.75
	5 years in program	22.43	46	3.40
	Total	20.78	529	5.63

Table D-2
1996-2001 Spanish Scores on the Student Oral Language Observation Matrix (SOLOM)
(Measuring Comprehension, Fluency, Vocabulary, Pronunciation, and Grammar)
by Number of Years Attending Two-way Dual Language Immersion Program:
Quasi-longitudinal Analyses

Students' Primary Language	Total Number of Years in Dual Language Immersion Program	Mean Score (Maximum score 25)	Number of Students Tested (N)	Standard Deviation
English	1 year in program	7.86	63	4.65
	2 years in program	8.04	97	4.49
	3 years in program	10.30	61	4.35
	4 years in program	13.66	35	4.56
	5 years in program	14.35	23	5.41
	Total	9.72	279	5.13
Spanish	1 year in program	21.49	55	5.54
	2 years in program	23.29	83	3.58
	3 years in program	23.50	50	3.75
	4 years in program	24.22	27	1.37
	5 years in program	23.74	23	3.37
	Total	23.07	238	4.05
Total	1 year in program	14.21	118	8.50
	2 years in program	15.07	180	8.65
	3 years in program	16.24	111	7.76
	4 years in program	18.26	62	6.35
	5 years in program	19.04	46	6.51
	Total	15.86	517	8.13

Table D-3
2001 English Scores on the Student Oral Language Observation Matrix (SOLOM) by Grade (Measuring Comprehension, Fluency, Vocabulary, Pronunciation, and Grammar): Quasi-Longitudinal Analyses

Students' Primary Language	Grade in 2001	Mean Score (Maximum score 25)	Number of Students Tested (N)	Standard Deviation
English	Grade 5	24.84	25	.80
	Grade 4	24.90	49	.71
	Grade 3	24.67	36	1.41
	Grade 2	23.65	43	2.94
	Grade 1	24.03	38	2.16
	Total	24.39	191	1.91
Spanish	Grade 5	18.86	21	5.78
	Grade 4	19.46	26	4.56
	Grade 3	15.81	32	4.92
	Grade 2	16.80	46	5.30
	Grade 1	13.81	32	4.82
	Total	16.71	157	5.38
Total	Grade 5	22.11	46	4.93
	Grade 4	23.01	75	3.76
	Grade 3	20.50	68	5.66
	Grade 2	20.11	89	5.51
	Grade 1	19.36	70	6.26
	Total	20.93	348	5.45

Table D-4
2001 Spanish Scores on the Student Oral Language Observation Matrix (SOLOM) by Grade (Measuring Comprehension, Fluency, Vocabulary, Pronunciation, and Grammar): Quasi-longitudinal Analyses

Students' Primary Language	Grade in 2001	Mean Score (Maximum score 25)	Number of Students Tested (N)	Standard Deviation
English	Grade 5	15.38	13	5.81
	Grade 4	13.61	38	4.75
	Grade 3	12.46	35	4.46
	Grade 2	9.67	43	4.75
	Grade 1	7.58	38	4.35
	Total	11.12	167	5.30
Spanish	Grade 5	24.71	21	.78
	Grade 4	23.31	26	3.82
	Grade 3	23.53	32	2.49
	Grade 2	24.09	46	1.53
	Grade 1	24.00	32	1.83
	Total	23.91	157	2.28
Total	Grade 5	21.15	34	5.82
	Grade 4	17.55	64	6.49
	Grade 3	17.75	67	6.65
	Grade 2	17.12	89	8.03
	Grade 1	15.09	70	8.92
	Total	17.32	324	7.61

Table D-5
1999-2001 Spanish Reading Mean NCE Scores on the Spanish Assessment of Basic Education (SABE) for Recent-arriving Spanish-speaking Students in Two-way Dual Language Immersion Program: Cross-sectional Analyses

	2001 SABE NCE Scores Total Reading	2000 SABE NCE Scores Total Reading	1999 SABE NCE Scores Total Reading
Number of Students	29	25	23
Mean	52.821	68.276	68.500
Median	54.200	73.700	72.700
Standard Deviation	14.602	20.072	21.680

Table D-6

1999-2001 Spanish Reading Mean NCE Scores on the SABE for Recent-arriving Spanish-speaking Students in Two-way Dual Language Immersion Program by Grade in 2001: Cross-sectional Analyses

Grade in 2001		2001 SABE NCE Scores Total Reading	2000 SABE NCE Scores Total Reading	1999 SABE NCE Scores Total Reading
Grade 7 in 2001	Mean			58.100
	N			1
	Std. Deviation			.
Grade 6 in 2001	Mean			60.700
	N			5
	Std. Deviation			17.883
Grade 5 in 2001	Mean	36.050	68.400	70.107
	N	2	8	15
	Std. Deviation	15.203	20.096	24.123
Grade 4 in 2001	Mean	54.286	68.469	
	N	7	16	
	Std. Deviation	9.505	21.331	
Grade 3 in 2001	Mean	51.994		
	N	18		
	Std. Deviation	15.092		
Grade 2 in 2001	Mean		64.200	
	N		1	
	Std. Deviation		.	
Total	Mean	51.407	68.276	67.295
	N	27	25	21
	Std. Deviation	14.117	20.072	22.189

Table D-7
1999-2001 English Reading Mean Scores on the Oregon Statewide Assessment for Grades 3 and 5 by Students' Primary Language: Cross-sectional Analyses

			2001 Reading			2000 Reading			1999 Reading		
Students' Primary Language	Grade	State %tile	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
English	3	45	212.3	14.0	30	207.1	17.8	37	206.9	14.7	28
Spanish	3	41	211.0	12.9	12	-----	-----	0	204.3	3.9	4
English	5	29	215.9	11.7	17	213.6	12.6	31	222.0	15.6	13
Spanish	5	14	211.9	7.6	14	207.4	7.1	16	208.3	7.5	8

Table D-8

English Reading Mean Scores on the Oregon Statewide Assessment: Frequency Distribution of 2001 Reading Scores for English Speakers in Grade 3

	2001 Reading Scores	Frequency	Percent	Valid Percent	Cumulative Percent
	186.0	1	1.5	3.3	3.3
	187.0	1	1.5	3.3	6.7
	194.0	2	2.9	6.7	13.3
	196.0	1	1.5	3.3	16.7
	200.0	1	1.5	3.3	20.0
Score of 201 or above: Student met or exceeded state standards	201.0	2	2.9	6.7	26.7
	205.0	2	2.9	6.7	33.3
	208.0	1	1.5	3.3	36.7
	209.0	2	2.9	6.7	43.3
	212.0	1	1.5	3.3	46.7
	214.0	3	4.4	10.0	56.7
	216.0	2	2.9	6.7	63.3
	218.0	2	2.9	6.7	70.0
	219.0	1	1.5	3.3	73.3
	221.0	1	1.5	3.3	76.7
	222.0	3	4.4	10.0	86.7
	229.0	1	1.5	3.3	90.0
	236.0	1	1.5	3.3	93.3
	237.0	1	1.5	3.3	96.7
	243.0	1	1.5	3.3	100.0
	Total	30			

Table D-9
English Reading Mean Scores on the Oregon Statewide Assessment:
Frequency Distribution of 2001 Reading Scores for Spanish Speakers in Grade 3

	2001 Reading Scores	Frequency	Percent	Valid Percent	Cumulative Percent
	193.0	2	3.7	16.7	16.7
	200.0	1	1.9	8.3	25.0
Score of 201 or above: Student met or exceeded state standards	202.0	1	1.9	8.3	33.3
	207.0	1	1.9	8.3	41.7
	211.0	1	1.9	8.3	50.0
	212.0	1	1.9	8.3	58.3
	214.0	1	1.9	8.3	66.7
	218.0	1	1.9	8.3	75.0
	222.0	1	1.9	8.3	83.3
	224.0	1	1.9	8.3	91.7
	236.0	1	1.9	8.3	100.0
	Total	12			

Table D-10
English Reading Mean Scores on the Oregon Statewide Assessment:
Frequency Distribution of 2001 Reading Scores for English Speakers in Grade 5

	2001 Reading Scores	Frequency	Percent	Valid Percent	Cumulative Percent
	195.0	1	1.3	5.9	5.9
	201.0	2	2.6	11.8	17.6
	203.0	1	1.3	5.9	23.5
	207.0	1	1.3	5.9	29.4
	214.0	1	1.3	5.9	35.3
Score of 215 or above: Student met or exceeded state standards	216.0	1	1.3	5.9	41.2
	217.0	2	2.6	11.8	52.9
	218.0	1	1.3	5.9	58.8
	219.0	2	2.6	11.8	70.6
	220.0	1	1.3	5.9	76.5
	226.0	2	2.6	11.8	88.2
	230.0	1	1.3	5.9	94.1
	241.0	1	1.3	5.9	100.0
	Total	17			

Table D-11
English Reading Mean Scores on the Oregon Statewide Assessment:
Frequency Distribution of 2001 Reading Scores for Spanish Speakers in Grade 5

	2001 Reading Scores	Frequency	Percent	Valid Percent	Cumulative Percent
	198.0	1	2.6	7.1	7.1
	202.0	1	2.6	7.1	14.3
	205.0	1	2.6	7.1	21.4
	207.0	1	2.6	7.1	28.6
	209.0	1	2.6	7.1	35.7
	210.0	1	2.6	7.1	42.9
	211.0	2	5.1	14.3	57.1
Score of 215 or above: Student met or exceeded state standards	215.0	1	2.6	7.1	64.3
	216.0	1	2.6	7.1	71.4
	217.0	1	2.6	7.1	78.6
	220.0	1	2.6	7.1	85.7
	222.0	1	2.6	7.1	92.9
	224.0	1	2.6	7.1	100.0
	Total	14			

Table D-12
1999-2001 Mathematics Mean Scores on the Oregon Statewide Assessment
for Grades 3 and 5 by Students' Primary Language: Cross-sectional Analyses

			2001 Mathematics			2000 Mathematics			1999 Mathematics		
Students' Primary Language	Grade	State %tile	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
English	3	40	206.7	11.6	31	206.4	12.6	40	210.1	13.0	28
Spanish	3	25	201.6	11.3	31	197.4	6.8	22	198.5	7.3	27
English	5	36	217.0	9.8	17	214.5	8.3	31	226.6	14.6	13
Spanish	5	24	213.0	9.0	17	209.2	6.4	18	211.6	7.8	8

Table D-13

Mathematics Mean Scores on the Oregon Statewide Assessment:

Frequency Distribution of 2001 Mathematics Scores for English Speakers in Grade 3

	2001 Math Scores	Frequency	Percent	Valid Percent	Cumulative Percent
	185.0	1	1.5	3.2	3.2
	193.0	1	1.5	3.2	6.5
	197.0	3	4.4	9.7	16.1
	198.0	2	2.9	6.5	22.6
	199.0	1	1.5	3.2	25.8
	200.0	2	2.9	6.5	32.3
Score of 201 or above: Student met or exceeded state standards	201.0	4	5.9	12.9	45.2
	202.0	1	1.5	3.2	48.4
	203.0	1	1.5	3.2	51.6
	204.0	1	1.5	3.2	54.8
	207.0	2	2.9	6.5	61.3
	208.0	2	2.9	6.5	67.7
	211.0	1	1.5	3.2	71.0
	213.0	1	1.5	3.2	74.2
	214.0	1	1.5	3.2	77.4
	216.0	1	1.5	3.2	80.6
	219.0	4	5.9	12.9	93.5
	229.0	1	1.5	3.2	96.8
	243.0	1	1.5	3.2	100.0
	Total	31			

Table D-14
Mathematics Mean Scores on the Oregon Statewide Assessment:
Frequency Distribution of 2001 Mathematics Scores for Spanish Speakers in Grade 3

	2001 Math Scores	Frequency	Percent	Valid Percent	Cumulative Percent
	179.0	1	1.9	3.2	3.2
	183.0	1	1.9	3.2	6.5
	184.0	1	1.9	3.2	9.7
	186.0	2	3.7	6.5	16.1
	189.0	1	1.9	3.2	19.4
	193.0	1	1.9	3.2	22.6
	194.0	1	1.9	3.2	25.8
	195.0	1	1.9	3.2	29.0
	196.0	1	1.9	3.2	32.3
	197.0	1	1.9	3.2	35.5
	198.0	2	3.7	6.5	41.9
	199.0	2	3.7	6.5	48.4
	200.0	1	1.9	3.2	51.6
Score of 201 or above: Student met or exceeded state standards	205.0	1	1.9	3.2	54.8
	207.0	1	1.9	3.2	58.1
	208.0	2	3.7	6.5	64.5
	209.0	1	1.9	3.2	67.7
	210.0	1	1.9	3.2	71.0
	211.0	2	3.7	6.5	77.4
	212.0	1	1.9	3.2	80.6
	213.0	1	1.9	3.2	83.9
	214.0	3	5.6	9.7	93.5
	216.0	1	1.9	3.2	96.8
	222.0	1	1.9	3.2	100.0
	Total	31			

Table D-15
Mathematics Mean Scores on the Oregon Statewide Assessment:
Frequency Distribution of 2001 Mathematics Scores for English Speakers in Grade 5

	2001 Math Scores	Frequency	Percent	Valid Percent	Cumulative Percent
	198.0	1	1.3	5.9	5.9
	204.0	1	1.3	5.9	11.8
	207.0	2	2.6	11.8	23.5
	211.0	1	1.3	5.9	29.4
	212.0	1	1.3	5.9	35.3
Score of 215 or above: Student met or exceeded state standards	215.0	1	1.3	5.9	41.2
	216.0	1	1.3	5.9	47.1
	217.0	1	1.3	5.9	52.9
	219.0	3	3.9	17.6	70.6
	226.0	1	1.3	5.9	76.5
	228.0	1	1.3	5.9	82.4
	230.0	2	2.6	11.8	94.1
	231.0	1	1.3	5.9	100.0
	Total	17			

Table D-16
Mathematics Mean Scores on the Oregon Statewide Assessment
Frequency Distribution of 2001 Mathematics Scores for Spanish Speakers in Grade 5

	2001 Math Scores	Frequency	Percent	Valid Percent	Cumulative Percent
	192.0	1	2.6	5.9	5.9
	199.0	1	2.6	5.9	11.8
	202.0	1	2.6	5.9	17.6
	209.0	3	7.7	17.6	35.3
	210.0	1	2.6	5.9	41.2
	214.0	1	2.6	5.9	47.1
Score of 215 or above: Student met or exceeded state standards	216.0	1	2.6	5.9	52.9
	217.0	2	5.1	11.8	64.7
	219.0	2	5.1	11.8	76.5
	221.0	3	7.7	17.6	94.1
	226.0	1	2.6	5.9	100.0
	Total	17			

Table D-17: State Department of Education Summary of Reading and Math Achievement Comparing Grant School, the School District, and the State in Grades 3 and 5

Percentage of Hispanic Students Meeting or Exceeding State Standards in 2001

Grade	Subject	Grant School		School District		State	
		# students	Percentage	# students	Percentage	# students	Percentage
3	Reading	12	**80%**	240	65%	2465	66%
3	Math	19	**53%**	225	44%	2261	50%
5	Reading	17	**27%**	172	40%	1819	51%
5	Math	11	**34%**	190	38%	1881	47%

Percentage of White Students Meeting or Exceeding State Standards in 2001

Grade	Subject	Grant School		School District		State	
		# students	Percentage	# students	Percentage	# students	Percentage
3	Reading	22	**79%**	1529	85%	26314	87%
3	Math	18	**62%**	1401	76%	24374	79%
5	Reading	17	**63%**	1405	75%	25943	80%
5	Math	18	**67%**	1365	72%	25154	77%

Percentage of Total Students Meeting or Exceeding State Standards in 2001

Grade	Subject	Grant School		School District		State	
		# students	Percentage	# students	Percentage	# students	Percentage
3	Reading	38	**81%**	1979	81%	32272	84%
3	Math	38	**55%**	1812	68%	29789	75%
5	Reading	28	**48%**	1778	69%	30823	77%
5	Math	31	**47%**	1759	65%	30132	73%

Table D-18
Summary of 2001 English Reading Mean Scores on the Oregon Statewide Assessment (SWA): Grant Students Meeting State Assessment Standards in English Reading for Grades 3 and 5 by Students' First Language

Students' Primary Language	Years in Two-way Dual Language Immersion Program	# Students not meeting SWA ENGLISH READING standards in 2001	# Students meeting SWA ENGLISH READING standards in 2001	# Students exceeding SWA ENGLISH READING standards in 2001	Total	% students meeting or exceeding standards in Grades 3 & 5
English	1-5	12	21	14	47	74%
Spanish	1-5	11	11	4	26	58%

Table D-19
Summary of 2001 Mathematics Mean Scores on the Oregon Statewide Assessment (SWA): Grant Students Meeting State Assessment Standards in Mathematics for Grades 3 and 5 by Students' First Language

Students' Primary Language	Years in Two-way Dual Language Immersion Program	# Students not meeting SWA MATH standards in 2001	# Students meeting SWA MATH standards in 2001	# Students exceeding SWA MATH standards in 2001	Total	% students meeting or exceeding standards in Grades 3 & 5
English	1-5	20	20	8	48	58%
Spanish	1-5	25	21	2	48	48%

Table D-20
Hierarchical Linear Regression Analyses: Effects of Socioeconomic Status and Years in Bilingual Program on Native-Spanish Speakers' Academic Achievement

Test	SES R-square minimum value	SES R-square maximum value	Years in Program R-square minimum value	Years in Program R-square maximum value
SOLOM - English	10.6% * +	11.7% * +	14.0% * +	15.1% * +
SOLOM - Spanish	0.2%	0.3%	0.8%	0.8%
SWA - Reading	3.0%	3.5%	5.8% +	6.3% +
SWA - Mathematics	3.4%	4.0%	0.7%	1.3%

Legend: * indicates statistical significance at $p<.05$
+ indicates practical significance (R^2 increment > 5%)

Table D-21
Hierarchical Linear Regression Analyses: Effects of Socioeconomic Status and Years in Bilingual Program on Native-English Speakers' Academic Achievement

Test	SES R-square minimum value	SES R-square maximum value	Years in Program R-square minimum value	Years in Program R-square maximum value
SOLOM - English	4.1% *	4.2% *	0.1%	0.1%
SOLOM - Spanish	1.8%	2.4%	19.5% * +	20.1% * +
SWA - Reading	7.4% +	10.6% +	5.7% +	8.8% * +
SWA - Mathematics	6.0% +	8.1% +	1.9%	4.1%

Legend: * indicates statistical significance at $p<.05$
+ indicates practical significance (R^2 increment > 5%)

Findings from a Mid-sized Urban Research Site in the Southeast U.S.

The Regional Social Context

For the most part, the linguistically and culturally diverse populations that exist in the states of the southeast U.S. are recent arrivals of the past one or two decades. The major exception to this demographic pattern in the southeast is the state of Florida, where significant numbers of immigrants from Cuba have been arriving since the early 1960s, when Fidel Castro's 1959 takeover of Cuba led to the first exodus of Cuban settlers to south Florida. Since then, succeeding groups from Cuba, Haiti, and other Caribbean countries, as well as Central America and other parts of Latin America have continued to send a steady stream of new settlers to Florida. Serving as a major shopping center for Latin America, Miami makes use of its diverse languages spoken by the city's population to supply businesses with the bilinguals needed for the flourishing local economy. Educators have responded to Florida's linguistically diverse population by providing ESL support and mostly transitional forms of bilingual schooling, although some two-way enrichment Spanish-English bilingual schools exist in several urban school systems in the state.

In contrast to Florida's experience with immigrants, the Old South of the early 1950s was still racially segregated, with blacks and whites attending separate schools and blacks not allowed to use most public facilities. International visitors were tolerated in education settings but it was assumed that those visitors would go back home. With the 1954 Supreme Court decision *Brown v. Board of Education*, segregation of whites and blacks in schools was ruled unconstitutional, and the southeastern states began a slow process of integrating schools. Following this development, two other significant national policies during the 1960s opened the door for future demographic changes in the southeast, not yet foreseen at that time. One was the Civil Rights Act of 1964, which bans discrimination on the basis of "race, color, or national origin" in any federally assisted program. This led to eventual desegregation of public facilities throughout the U.S., and a gradual lessening of the separation of blacks and whites in the southeast. As blacks began to have the socioeconomic and educational opportunities to move out of positions of menial labor and into white collar and service occupations, this paved the way for more migrant laborers from Mexico and Central America to move into low-paid positions vacated by blacks.

The second significant development occurred when the amendments to the Immigration and Nationality Act of 1965 removed quotas, giving peoples of all countries of the world the opportunity to emigrate to the U.S. Previous immigration policies had favored European immigrants. Few policy makers foresaw that this provision would increase immigration significantly, especially from developing countries (Smith & Edmonston, 1997). In the southeast U.S., the trickle of immigrants began with seasonal migrant workers, who tended to the agricultural crops and moved from rural community to community, just as in other parts of the U.S. At the same time, word spread in Mexico and Central America that there were new economic opportunities and more open policies toward immigration, and Hispanic immigrants began to arrive in initially small numbers in the urban centers of the southeast during the 1970s and 1980s. By the 1990s, with less discrimination openly expressed towards people of color, Hispanic migrant farm workers also began to settle in established communities, mainly in urban areas. With the flourishing economy of the 1990s, southeastern states such as Georgia and North Carolina found it necessary to recruit groups of workers from Mexico and Central America, to occupy jobs that otherwise went unfilled. Thus a region that half a century ago had well established social rules for legal segregation between groups has gradually become more diverse and increasingly tolerant of the new arrivals, for the sake of economic development.

Educators' response to these new arrivals in the southeastern states generally has been to build on the experience of other states, starting with ESL support, and to add some bilingual services when a sufficient number of students of one language background are enrolled. Most southeastern U.S. cities have a variety of languages represented among their immigrant population, but the majority are Spanish speakers. With the exception of Florida, very few southeastern states have enacted state legislation supporting state funding or policies for the education of language minority students; thus decisions regarding programs are largely left up to the local school district. As in the northwest U.S., schools in the southeast are struggling to provide appropriate and meaningful curricular assistance for these new arrivals, since this is a relatively recent phenomenon. One of our urban school district sites located in the southeast that has had over two decades of experience working with increasing numbers of immigrant arrivals provides a regional example of school responses to the needs of these students. Since this school system has not self-identified, in this report it is referred to as District E.

The School District Site

This mid-sized urban school district currently serves over 18,000 students, 40 percent of whom qualify for free or reduced lunch. Language minority students represent 44 percent of the total school population, while students of Euro-American background are 41 percent and African-Americans are 15 percent of the total. As is true of most of our school district sites throughout the U.S., Hispanics are the fastest growing group in this school district, from 10 percent of the total enrollment in the early 1980s to 33 percent in 2000. Asian-Americans are currently 10 percent of the total school population.

In 1975, in this school district there were fewer than 900 English language learners receiving ESL pullout one hour per day. As of the year 2000, there were over 4,600 English language learners attending ESL pullout, ESL content, one-way or two-way developmental bilingual education classes. ELLs receiving bilingual/ESL services are one-fourth of the total school population and 58 percent of the language minority school population. While over 80 languages and 96 countries are represented among the English language learners, the large majority are Spanish speakers (72 percent) from the United States and Latin America. Whereas in the early 1980s this school district was serving mostly first-generation immigrants just recently arrived, two decades later it is receiving increasing numbers of second-generation U.S.-born students, some of whom are the children of their graduates and dropouts. Almost 50 percent of the current English language learners of District E were born in the United States, and thus are U.S. citizens.

This school district provides an interesting glimpse at education decision-making for English language learners who have experienced difficult life circumstances that often lead to poor achievement in school. Many of these students, as well as their parents, have experienced interrupted schooling in their home countries for a variety of reasons. These include fewer school hours per day because of overcrowded schools, or limited accessibility to formal schooling in remote or rural regions, or missed years of schooling because of war or political instability, as well as sometimes long periods of family separation. As of 1994, 25 percent of the entering kindergarten Hispanic students tested very low in proficiency in both their native language, Spanish, as well as in English, and this pattern continued for the next several years. Given these challenges, which are increasingly common for school districts across the U.S. receiving newcomers from many varied circumstances, more support for these students is clearly needed than that required for middle-class native-English-speaking students who are achieving on grade level.

District E has made a commitment to continue to increase the academic achievement of all students, including closing the achievement gap between whites and minorities. Overall, as a total group, students of this school district score well on standardized tests, and the high school graduation rate is 93 percent, with 90 percent of the graduates continuing in post-secondary education. But when achievement levels are broken down by subgroups, language minority and African-American students are scoring significantly below the level of Euro-American students, but making some gains towards closing the achievement gap with each year of school. In this report, we are focusing on the patterns of achievement among language minority students, with special focus on those language minority students who began school with limited proficiency in English. We shall concentrate most of our focus on the ESL content program, since that is the longest-running program, serving the largest number of students.

Programs for Language Minority Students in District E

ESL pullout. At the elementary school level, the first program in this district developed for English language learners was an ESL pullout program. Each ESL teacher served as a resource teacher for many classrooms in one school. ESL students were pulled out of their mainstream classroom to work with the ESL teacher for one period per day, focusing on developing listening and speaking skills in English. At the secondary level, students received one period of ESL instruction focused on teaching the grammar structure of English.

ESL pullout is still used in some elementary schools in the district where there are not sufficient numbers of ESL students to provide more support, but the focus of the ESL teacher's lessons now includes reading and writing in English as well as oral skills, taught through some curricular content. In some schools, ESL students are given extra assistance within the mainstream classroom, through an ESL inclusion model, where the ESL teacher supports or teams with the mainstream teacher for a small number of ESL students. At secondary level, all instructional support is now provided through ESL content classes.

ESL content. By the early 1980s, with increasing numbers of ELLs entering the school system, the ESL pullout program was restructured to provide more varied approaches to teaching ESL, not just focusing on the English language, but teaching English through academic content. As more certified ESL teachers and bilingual support staff were hired with each succeeding year, and staff development sessions strengthened the skills of the teachers, the ESL content curriculum was expanded until it covered material parallel with that of the mainstream curriculum for all subject areas. New arrivals with little or no proficiency in English were assigned to ESL content teachers for a significant proportion of the school day.

The current ESL content program integrates the teaching of language with content area instruction across the curriculum through thematic units that are cognitively complex while instructionally appropriate for the students' level of English proficiency. Students with beginning and low-intermediate levels of ESL proficiency are generally taught by the ESL content teachers for a full academic day at secondary level and a half-day at elementary school level. ESL beginners interact with native-English speakers for physical education, art, and music. Sometimes ESL teachers team with mainstream teachers or a bilingual teacher or bilingual teaching assistant might team with an ESL teacher. Advanced ESL students gradually move towards the mainstream with less time spent with the ESL content teachers.

One-way developmental bilingual classes. After analyzing collaboratively with us the longitudinal progress of students who had attended the ESL content program, district staff decided that students who did not have the opportunity to be formally schooled in their first language were doing the most poorly in school. Given the large number of Spanish speakers with great needs, including English language learners who were testing low in proficiency in both languages when they entered kindergarten, the ESL/bilingual staff decided to expand their bilingual services, beyond counseling and providing translation for families, to a half-day of literacy development through social studies and science content instruction in Spanish for Spanish speakers. They based this decision on a review of available national research on effective programs for ELLs and on their local data analyses and needs assessments.

This decision led to a formal program that was implemented in four elementary schools, beginning with kindergarten, and adding one grade each year. Spanish-speaking students whose parents have chosen for them to be in this program spend half a day in content instruction in Spanish and half a day in content instruction in English. In this report, we will not present student achievement data from this program, because the students have not yet been tested on any nationally normed test, since they have only reached the second grade. However, we have observed that, on informal measures of reading achievement in English, students in this one-way DBE program are outscoring their comparison groups attending ESL content classes without first language support. Hispanic parents have heartily supported the program and want to see it continued and expanded, since their children are enthusiastic participants and are doing well in school.

Two-way bilingual classes. This school district also developed 50-50 Spanish-English bilingual schooling for students at four elementary schools and continuing at one middle school. The program initially was developed by the foreign language department primarily to serve native-English speakers whose parents wanted their children to acquire Spanish. Over time, the program has evolved into a two-way program with native-Spanish speakers invited to participate in the classes. Our data analyses will not include students attending this program, since it is not part of the services provided by the bilingual/ESL department.

Teacher credentials and teaching practice. All bilingual/ESL classroom teachers of this school district are certified ESL teachers, with two-thirds of the teachers of the school system holding masters degrees. The school system provides extensive staff development support each year for all teaching staff, and many of the courses offered through staff development have led to new curricular initiatives on the part of the faculty. Over the years of the program, increasing numbers of Hispanic teachers and teacher assistants who come from the students' countries of origin have been hired. These teachers provide significant bicultural support for the students and they are able to counsel families in their home language. Teaching practices include extensive use of cooperative learning, thematic units that integrate subject areas across the curriculum, multiple intelligences research and learning styles research applied to bilingual learners, whole language approaches to literacy development combined with balanced literacy instruction, activating students' bilingual/bicultural knowledge, multicultural literature, authentic assessment, and connecting to families and community knowledge. In the developmental bilingual classes, one teacher provides the instruction for a half day in Spanish and an ESL content teacher is the instructor for the English portion of the day.

Results in Student Academic Achievement

Stage 1 analyses. We will use the analyses from this school district to provide an example of the research stages that we proceed through as the student databases are gathered year by year. Each stage leads to new analyses and a cycle of collaborative interpretation of the findings and their implications for decisions on the school programs provided for language minority students. District E had well-collected longitudinal historical data and lower LM student mobility than is typical of most U.S. school districts. That allowed us to assist them with longitudinal analyses very soon after we began working with them, since there were good records on what type of program the students received and enough LM students remained in the school system for a number of years to analyze how they were doing academically. After we collected and merged over five years of testing databases, with each student record identified by a unique student ID number assigned to only one student, for Stage 1 analyses, we examined the achievement levels of three distinct groups who had attended this school district for at least five years. These first analyses that we presented to the school district for reflection and interpretation of their meaning are shown in Figures E-1 through E-5 and Tables E-1 through E-5. These findings examined whether the school district, up to that point in time, had met its goals of closing the achievement gap between three significantly different groups of students.

The first group of students, those labeled "former LEPs" in the figures, were those students who, when they first entered the school district in the early elementary school grades, tested very low in proficiency in English. They were assigned to the ESL program. These students received ESL content classes (half day) or pullout classes (with some academic content taught along with language during the ESL pullout time) for 1-3 hours of each school day. After most had received 2-3 years of ESL support, they were assessed as proficient enough in English to enter the curricular mainstream for the full school day. The norm-referenced assessment at Grade 8 (Iowa Test of Basic Skills) measured their performance after at least five years of schooling in English in District E. We chose five years as a minimal time period because the research on length of time for acquisition of a second language used for academic purposes has found that it generally takes students at least 4-7 years to reach on-grade-level performance in second language (Collier, 1989, 1992; Cummins, 2000; Hakuta, Butler & Witt, 2000; Thomas & Collier, 1997).

The second group of students, labeled "LM but never LEP" in the figures, were those language minority students attending District E who tested as proficient in English when they entered this school system. These students of mostly Hispanic (16.2 percent of total school population) and Asian (1.8 percent) background were assigned to the English curricular mainstream from the beginning of their schooling and did not need ESL support. They served as the main comparison group for former limited-English-proficient students who had received ESL support. The expectation was that after at least five years of English schooling, the former-LEP ESL graduates would eventually catch up to the level of achievement of their language minority peers. Stage 1 of our research was designed to investigate whether this did, in fact, occur.

The third group of students were native-English speakers attending District E. These Euro-American (41 percent) and African-American (15 percent) students were the remaining groups of the school system, serving as another comparison group that represents the level of attainment achieved by the local students who grew up in native-English-speaking families.

The long-term goal of this school district is for all groups to reach comparable achievement levels. This does not mean that the ultimate goal is that all individual students score high on a norm-referenced test. On any given test administration, there are always some high and some low scorers. Thus, there is considerable variation among the individual student scores within a selected group. But equal educational opportunity means that there should be no *groups* of students whose average scores are consistently low year after year while other groups of students are scoring consistently high. So the long-term goal is educational parity for all the student groups of a given school district, whether groups are defined by socioeconomic status, or by linguistic background, or by country of origin, or by ethnicity, or by gender, and so forth.

For District E, how did these three groups do, when they were tested on the difficult norm-referenced tests in the secondary school years, at Grade 8 and then the same students were tested again at Grade 11? Figure E-1 and Table E-1 show their achievement levels on the most difficult subtest, Total Reading, which measures language usage across the curriculum. In order for students to do well on this subtest, they must develop knowledge in all subject areas for their grade level and be able to integrate and apply that knowledge in various problem-solving tasks.

The first group, the ESL Content graduates (former LEPs) who had at least five years of schooling all in English by the time they had reached the 8th grade, were the lowest achievers of the school district, reaching the 36th NCE (26th percentile) in 8th grade and the 37th NCE (27th percentile) by 11th grade. Their comparison group of language minority peers (who tested sufficiently proficient in English when they began schooling in District E, so that they were not placed in the ESL Content program) reached the 55th NCE (59th percentile) by 8th grade and maintained that performance at the 53rd NCE in 11th grade (a non-significant two-NCE difference). This is excellent achievement, above the 50th percentile of the norm group of native-English-speakers across the country. This is a high-achieving school district, though, as can be seen in the third group's scores, with the native-English speakers reaching the 66th NCE (77th percentile) by 8th grade and maintaining almost that high a level at the 63rd NCE at 11th grade.

These three groups' scores followed this same general pattern on all the other subjects tested, as can be seen in Figures E-2 through E-5 and Tables E-2 through E-5. Math, social studies, science, and writing performance were higher than reading performance for all three groups, but each group maintained its same relative position when compared to the other two groups' achievement. In math, the ESL graduates reached the 49th NCE (49th percentile) in 8th grade but their math achievement by 11th grade was at the 44th NCE (39th percentile). Their social studies achievement reached the 46th and 44th NCE. In science, they were at the 41st NCE in 8th grade and jumped to the 48th NCE by 11th grade, a practically and statistically significant gain, close to reaching the 50th percentile. For the writing assessment they reached the 38th NCE in 8th grade and the 47th NCE by 11th grade, also a practically and statistically significant increase.

In comparison to reading achievement, language minority students entering the school district with proficiency in English scored above the 50th percentile on every other measure, at the 61st NCE (70th percentile) in math in 8th grade and the 55th NCE (60th percentile) in 11th grade, the 59th and 55th NCEs in social studies, the 57th and 59th NCEs in science, and the 57th and 56th NCEs on the writing assessment. Native-English speakers who were not language minority in background scored still higher on these subtests, at the 68th and 63rd NCEs in math, the 68th and 65th NCEs in social studies, the 68th NCE in science on both the 8th and 11th grade test, and the 67th and 66th NCEs on the writing assessment.

After examining their own school district data longitudinally in this way, District E staff chose to work on raising the achievement levels of their most at-risk groups. The lowest achieving students were those who had started school with little or no proficiency in English, the students labeled as "former LEP" in the five figures just examined. Their total reading scores had reached the 37th NCE (27th percentile) by Grade 11, after receiving a very well-implemented ESL content program. Administrators and bilingual/ESL resource staff of the ESL Department began to reflect on ways to improve their programs.

The ESL content program had already been substantially changed over the years, to increase academic achievement levels of ESL students. The ESL pullout program that was first implemented when immigrant students began to enroll in the school district focused on teaching listening and speaking skills of the English language. As the ESL content program was developed and then expanded, ESL teachers took responsibility for teaching both oral and written English language development, as well as some of the academic content areas. The ESL curriculum grew until it paralleled the mainstream curriculum as much as possible, with six levels of English proficiency development. ESL teachers received many hours of staff development and were given planning time to coordinate with mainstream teachers, so that the ESL students would be prepared for the mainstream. After an extensive programmatic analysis, the staff decided that they had a very well designed and implemented ESL content program, and we agreed. The main missing instructional support was that they were not yet providing the students with development of literacy in primary language and academic work taught through the students' primary language.

Thus the school district decided to implement some classes taught in Spanish for the elementary school students whose parents chose for their children to receive instruction part of the day in Spanish. The one-way developmental bilingual education classes that grew out of this administrative decision started with kindergarten and have now reached second grade level, with academic subjects taught half of the day through Spanish and half of the day through English. Future analyses will examine how these students are doing in comparison to their monolingually schooled peers. Research results from other school districts have given this school district confidence that these students will ultimately raise their academic achievement to levels higher than that of previous groups who received only the ESL content program.

Stage 2 analyses: Length of residence in the U.S. For the readers of this report who are familiar with the classic research studies that have helped define the knowledge base for the field of language minority education, we are using the term "length of residence (LOR)" as it was first used by Jim Cummins (1981) when he published one of the most often-cited studies in this field. In this study, Cummins analyzed immigrants' school achievement data, focusing on two main variables, length of residence and age on arrival in Canada. He found that Canadian school-age immigrants took 5-7 years after their arrival in Canadian schools to reach the grade-level achievement in English of their native-English-speaking peer group. We have conducted studies similar to that of Cummins' work in our analyses of school system databases in the U.S. (Collier, 1987; Collier & Thomas, 1989; Thomas & Collier, 1997), and have found the same general data patterns that Cummins found. However, we have extended the original research questions of Cummins by analyzing many more student background variables and program variations, and by examining which variables have the strongest influence on student academic achievement in their second language. Finally, we have examined which of these variables can affect how long it takes for former English language learners to reach levels of group performance similar to native-English speakers.

We have found that it can take longer than 5-7 years if some variables are not present, with the most influential variable being the amount of formal schooling that the students received in their primary language. The shortest time frame we have found for groups to reach grade-level achievement in second language is 4-7 years, but that applies only to students who have received quality, grade-level schooling through their two languages. Our Stage 2 analyses examine the original research questions of Cummins (1981) with each dataset. Thus we shall now analyze the influence of length of residence in the U.S. in the datasets currently being examined from District E.

Figure E-6 and Table E-6 present a quasi-longitudinal look at different groups of English language learners who remained in the school district from 3 to 9 years, allowing us to follow their progress across time. All of these students initially enrolled in the ESL Content program, having tested low in proficiency in English when they entered this school system. We classify these analyses as quasi-longitudinal because we are not using a specific pretest measure for this particular display, since there was no available pretest that was comparable to the Grade 11 test for all students. The patterns here, however, are very similar to those in the longitudinal findings. All the points in the figure represent the Grade 11 achievement of former English language learners (ELLs/LEPs) on the Tests of Achievement and Proficiency, which is the 11th grade version of the Iowa Test of Basic Skills (ITBS) norm-referenced test. At the 11th grade level, this test, as well as the Stanford 9 and Terra Nova and other similar nationally normed tests, provides a strong indicator of students' predicted performance on the SAT and other measures used for admission to higher education institutions. This is the "ultimate" measure required of students in Grades K-12, the one which most effectively provides a school district with a measure of its level of success at graduating students who will have the opportunity to continue their schooling if they so choose. State standards on state-required academic assessments vary greatly from state to state, so we have chosen in this report to focus mainly on reporting performance on nationally normed tests that may be compared from state to state.

In Figure E-6, these immigrants to the U.S. first took the standardized tests in English after they had been schooled in English for at least three years. Students who had experienced interrupted schooling in their home country before they came to the U.S. are not included in this display. Thus the 11th grade students who had 3 years of schooling in the U.S. left their home country sometime during 8th grade, and had received that much formal schooling through their first language. Those students in the U.S. for 4 years left home country at 7th grade level, and so forth.

For all subject areas (all lines in the figure), with each additional year of schooling in English, each group is making steady progress to a still higher level of achievement through year five. But after that point, additional years of schooling in English do not raise these former LEP students' achievement level further. Since we have found a similar pattern in other school districts' data, we have come to view this peak in performance as the maximum level of achievement that can be expected, based on the particular program the students received. What the maximum level is and when it occurs varies by program type.

In our collaborative interpretation of the data findings with school district staff of District E, we concluded that a variable that appeared to influence the student achievement of those in the U.S. for 7, 8, and 9 years was the amount of formal schooling that they had received in their home country before they came to the U.S. These groups all started at the same level of limited proficiency in English as assessed by locally developed tests. The main difference between groups, according to ESL/bilingual staff, was the time in their lives when they arrived in the United States. Those arriving at the beginning of 9th grade who were tested at the end of 11th grade (having been here three years) were the lowest achievers in the figure, but the ESL/bilingual staff agreed that their level of achievement on this difficult test was very appropriate, given that they only had three years of exposure to English to date. All they needed was more time–several more years of schooling in English–for them to continue to catch up to grade level (to close the gap).

After 4 years of schooling in English, the ESL content graduates had reached the same level of achievement as those with 7 years of schooling in English. But the latter group left their country after receiving only 3 years of primary language schooling; whereas the former group with much less English instruction had received 6 years of primary language schooling. Those with 8 years of schooling in the U.S. had only 2 years of primary language schooling from their home country, and those with 9 years in the U.S. had received only one year of primary language schooling before they had to leave home country sometime during 2nd grade. In other words, these lower achievers had 1-3 years of primary language schooling before arrival in the U.S. The highest achievers, those who had been schooled in the U.S. for 5-6 years, had received 4-5 years of primary language schooling before arrival in the U.S. These findings gave further confirmation to the decision to provide some primary language (L1) content instruction for students with little or no formal schooling in L1.

Figure E-6 also provides a useful view of variations in achievement by curricular subject. We have seen this pattern repeated in many school district datasets. Reading achievement is consistently the lowest of all subjects, as measured by nationally standardized tests. As stated before, this is the most difficult subtest because it measures problem-solving across the curriculum. For that reason, we focus on this subtest as the ultimate attainment when summarizing patterns in the achievement data. These students reached their highest levels of performance in second language in math and science sooner than in other subjects. Social studies is a still more difficult subtest in which to demonstrate one's knowledge through one's second language, but the reading measure is the most difficult subtest of all because it is combining social studies, literature, math, and science knowledge. On the reading measure, these ESL Content graduates reached the 23rd NCE (10th percentile) after 3 years of schooling in English, the 29th NCE (16th percentile) after 4 years, the 36th NCE (26th percentile) after 5 years, and maintained relative performance at the 35th NCE (24th percentile) after 6 years of schooling in English. These are statistically and practically significant gains in closing the achievement gap. But no succeeding groups of ESL Content graduates with more than 5 years of schooling in English were able to close the gap further.

Figure E-7 and Table E-7 illustrate the analyses from the next school year, examining the same question to see if any patterns had changed. This time the data was grouped according to the LOR patterns seen in the previous year's analyses. Similar patterns are present in this data. The groups with the highest achievement were consistently those with 4-6 years of schooling in English and at least 3-5 years of schooling in primary language in home country before they emigrated to the U.S. This group reached the 32nd NCE (20th percentile) in reading, the 40th NCE (32nd percentile) in math, the 39th NCE (30th percentile) in social studies, the 42nd NCE (35th percentile) in science, and the 41st NCE (34th percentile) in writing on the difficult 11th grade norm-referenced test.

Age on arrival, the second variable that Cummins analyzed, was a parallel variable with length of residence. Those students who received only 1-3 years of primary language schooling in their home country before coming to the U.S. for the remainder of their schooling were the youngest age group on arrival, ages 6-8. This group was the lowest-achieving group among those in the U.S. for 5-9 years, even though they had the longest exposure to the English language.

Stage 5 analyses: Prior formal schooling in home country. Since only one program type–ESL content–was provided for English language learners when we first began working with this school district, Stage 3 analyses were not applicable (comparing program types). Thus we moved on to Stage 4, by adding more cohorts with each additional year of the program. Results of these analyses did not yield any significant changes in the student achievement levels reported above, under Stage 1 and Stage 2 findings. Finally, having achieved generalizability with sufficient numbers of students of similar background in each cohort (Stage 4), we moved to Stage 5 analyses, to examine student background variables and their influence on student achievement.

Stage 2 analyses (presented above) identified three variables that appear to have strong influence on English language learners' academic achievement in English–the number of years of primary language schooling, the number of years of schooling in English, and students' age upon entry in U.S. schools. These three variables are strongly interrelated. First, these students need at least 4-7 years of schooling in English to acquire enough proficiency in academic English. As stated earlier, our findings as well as those of other researchers, demonstrate that this is the shortest amount of time in which a group of students can reach grade-level performance on standardized tests in their second language. Second, these same students may never make it to grade-level performance without several years of primary language schooling, provided either in home country or in host country. Our findings from other school districts demonstrate that 4-5 years of primary language schooling are needed to reach grade level in second language. Third, age on arrival is connected to year of arrival. Thus English language learners who are very young (ages 5-8) when they enter U.S. schools and who do not receive any primary language schooling are the most "at risk" group for not achieving long-term achievement gap closure (Collier, 1987; Collier &

Thomas, 1989; Thomas & Collier, 1997; as well as the analyses presented above).

Figure E-8 and Table E-8 present the achievement levels of the ESL Content graduates at 11th grade by the number of years that their schooling was interrupted in home country, before they came to the United States. This provides a clear and dramatic picture of the impact that lost years of schooling has on these students. Other student background variables in this figure are controlled by creating "blocks," or groups of students with the same or similar background on several different variables. That means that all groups in this figure entered this school district at the same beginning level of English proficiency; they were Spanish speakers; and they were on free or reduced lunch, thus classified as of lower socioeconomic status. Also they all received the same ESL Content program when they first arrived. The main difference among the groups was the number of years below grade level, as assessed upon the students' entry in this school district.

The first group, on the left side of the figure, represents Spanish-speaking LEP students who tested on grade level in Spanish when they arrived, on formal measures in Spanish reading and mathematics. This is the comparison group for the subsequent groups in the figure. The next group of students were one year below grade level upon entry. As can be seen, each additional year of lost schooling in home country results in lower Grade 11 academic performance in English, even when other potential influencing factors are controlled. In reading achievement, the comparison group with no lost schooling was at the 34th NCE (23rd percentile); one year of lost home country schooling resulted in performance at the 29th NCE (16th percentile); two years of lost schooling–the 26th NCE (13th percentile); and three and four years of lost home country schooling–the 20th NCE (8th percentile) and 19th NCE (7th percentile) respectively. Having only 23 students in this last group with four years of lost home country schooling may have made this group's achievement slightly higher than if all possible students with this background had been tested. Many of these students with a significant number of years of interrupted schooling had already dropped out of school by the end of 11th grade when this test was given. These findings, combined with the findings above on number of years of primary language schooling needed to raise academic achievement levels in second language, demonstrate that number of years of primary language (L1) schooling is a powerful variable influencing L2 academic performance.

Stage 5 analyses: Socioeconomic status. Many educators believe, and numerous research studies have confirmed, that socioeconomic status can be a very powerful variable that influences student achievement. We focused on the influence of this variable by controlling the student background variables of primary language spoken and proficiency in second language. Figures E-9 through E-13 and Tables E-9 through E-13 present our analyses of Spanish speakers who either paid for their lunch, received reduced-price lunch, or received free lunch. The group in the figure labeled "former LEP students" were Spanish speakers who were placed in beginning-level ESL classes in the ESL Content program upon their arrival in the school district. These students had been in the school district for at least five years when they took the Tests of Achievement and Proficiency (TAP) at the end of 11th grade. The group labeled "LM-never-LEP students" were Spanish speakers who tested sufficiently proficient in English when they entered the school district to be placed in the mainstream. The figures demonstrate a visible relationship between family income as measured by paid, reduced price, or free lunch and these students' Grade 11 achievement levels.

Among the three socioeconomic measures–middle income (pay for lunch), low-to-middle income (reduced lunch), and low income (free lunch), on the reading measure (Figure E-9 and Table E-9) the former LEP students reached the 35th, 30th, and 27th NCEs respectively (24th, 17th, and 13th percentiles), with a practically significant difference between the paid-lunch and reduced-lunch groups and between the paid-lunch and the free-lunch groups. The language minority students who were not classified as LEP reached the 52nd, 43rd, and 39th NCEs respectively (54th, 37th, and 30th percentiles), with a very large and statistically significant difference between paid-lunch and free-lunch groups. However, not being proficient in English upon entry to the school system, and thus getting behind in academic work while learning English, was a stronger influence on ultimate attainment than socioeconomic status (SES), as seen in the contrasting achievement levels between the two groups. For example, the free lunch (lowest SES) students in the language minority group who were proficient in English upon entry were achieving at a higher level–the 39th NCE–than the highest SES students who were not proficient in English upon entry, who scored at the 35th NCE– again a significant difference. The one group that attained grade-level achievement on this very difficult 11th grade academic test that measures problem-solving across the curriculum were those language minority students who entered proficient in English and were from middle-income families, as measured by their ability to pay for lunch. These students reached the 52nd NCE (53rd percentile), slightly above the national norm group.

Similar patterns are present in the other subject tests (Figures E-10 to E-13 and Tables E-10 to E-13). On math, the language minority groups reached the 55th, 50th, and 45th NCEs, while the former LEP students only reached the 43rd, 37th, and 37th NCEs. For social studies, the language minority students were at the 55th, 47th, and 44th NCEs, and the former LEP students reached the 42nd, 38th, and 37th NCEs. On science achievement, the language minority students were at the 57th, 50th, and 48th NCEs, and the former LEP students at the 45th, 40th, and 39th NCEs. In the writing assessment, the language minority students reached the 56th, 50th, and 46th NCEs, while the former LEP students reached the 44th, 39th, and 37th NCEs.

On all of these subject tests, the free lunch groups performed the lowest. On all measures, the language minority group that paid for their lunch, an indicator of middle-income background, performed at or above grade level at the 52-57 NCE level. But the former LEP students who paid for their lunch only reached the 35-45 NCE level on these measures.

In summary, socioeconomic status as measured by paid, reduced price, or free lunch may have some considerable influence on student achievement. But when students are schooled only in English in U.S. schools, proficiency in English upon entry has a stronger influence than socioeconomic status. Yet when comparing these SES findings to the SES findings in other school districts that provide enrichment bilingual schooling, it is evident that socioeconomic status has much less influence when grade-level academic work is provided in both students' primary language and English. Since schools cannot change students' socioeconomic status or proficiency level in English when students first arrive, it is more appropriate and meaningful to focus on changes in the school program, to meet students' needs. In a following section, we use multiple linear regression to describe our SES findings more completely.

Stage 5 analyses: Gender. The final variable that we examined for potential differences in achievement was gender. Figure E-14 and Table E-14 present differences in academic achievement levels by gender among Spanish speakers who were placed in the ESL Content program upon entry and then exited to the mainstream. As with the previous displays, we examined these students' achievement on the Tests of Achievement and Proficiency given at the end of 11th grade, after they had received at least five years of schooling in this school district. On the two measures of English language development across the curriculum–reading and writing–males and females reached the same level of performance. Hispanic females and males were at the 31st NCE (18th percentile) on reading, and at the 40th NCE (31st percentile) (females) and 39th NCE (30th percentile) (males) on the writing measure. On the social studies measure, males a. the 40th NCE outperformed females by 3 NCEs, but this difference is not practically significant. The two subjects in which males outperformed females at significant levels were math (4 NCEs higher) and especially science (6 NCEs higher). These Hispanic males reached the 44th NCE (38th percentile) on this difficult 11th grade science test, while Hispanic females reached the 38th NCE (28th percentile) in science. These gender comparisons in achievement are similar to gender differences in the general school-age population.

In Figure E-15 and Table E-15, gender differences are presented for students who are language minority but who tested proficient in English when they entered the school district. Here males significantly outscored females in science by 5 NCEs, while females significantly outperformed males on the writing assessment by 6 NCEs.

Multiple regression analyses. We examined District E's data on former English language learners (former LEP students) using simultaneous (direct entry) multiple linear regression in order to examine the unique effect of each of several independent variables. We also used hierarchical stepwise regression to assess the total effect of each variable by assessing the change in multiple R^2 that accompanied that variable's entry into the regression equation. All regression analyses were conducted only on data from students who were assessed as beginning level of proficiency in English when they entered the school district.

In the first series of regression runs, the criterion (dependent) variable was the students' 11th grade ITBS/TAP NCE scores in reading. The variables available as predictors were as follows: students' ITBS 8th grade reading score, students' socioeconomic status as measured by lunch status (free, reduced, paid), years of prior schooling, years of schooling in English, age on arrival (age at beginning of instruction in English), student gender, years of missed schooling prior to entering District E, and grade completed in prior schooling.

In the first regression, 8th grade reading achievement was entered as a covariate in a hierarchical first step, and then the remaining predictors were entered simultaneously in a second hierarchical step, in order to assess their effect on 11th grade reading as adjusted by 8th grade reading. The adjusted dependent variable thus represented the achievement change, a measure of gap closure, in reading between grade 8 and grade 11.

Both steps contributed significantly to the total R^2 as seen in Table E-16. The covariate 8th grade reading increased R^2 from zero to .39 while the second step, consisting of the seven remaining predictors, explained an additional 9.1 percent of variance in the adjusted dependent variable. Of the seven predictors, only student socioeconomic status had a significant unique effect on reading achievement change. However, the trend was non-linear in that the reduced lunch group had achievement means 9 NCEs lower than the paid lunch group while the free lunch students scored only 2.2 NCEs lower.

In a second series of multiple regression runs, we regressed the seven predictors on 11th grade reading achievement without covarying out the effect of 8th grade reading achievement. The results appear in Table E-17. In this case, the dependent variable was unadjusted for the effects of 8th grade reading, and the effect of the predictors on 11th grade reading scores was being examined. The predictors collectively explained 15.4 percent of 11th grade achievement, and socioeconomic status, gender, and years of lost schooling were all significant at the .05 level. Specifically, free and reduced lunch students both scored about 5 NCEs lower than the paid lunch group, and males scored about 3 NCEs higher than females by grade 11. In addition, each year of lost schooling reduced grade 11 reading achievement by almost 3 NCEs.

When all predictors were entered in a backward selection procedure (see Table E-18), the variables socioeconomic status, gender, and grade completed in prior schooling emerged as the optimum combination. Grade completed in prior schooling and years of schooling in English were inverse measures of the same construct, but the former edged out the latter in the backward selection process between model steps 6 and 7, as shown in Table E-18. In this analysis, each grade completed prior to entering District E added about 2 additional NCEs to the 11th grade reading score. This means that the most powerful variable influencing student achievement in the long run is the number of years of formal schooling in home country that the students completed. In other words, the more primary language schooling that these students had before arriving, the higher their achievement in English, in the long term.

Conclusions

District E provides an excellent example of the process that a school district goes through from the first years that new immigrants begin to establish themselves in the community to the new decisions that must be made year by year as increasing numbers of language minority students enroll in the school system. This school district staff are exemplary in their collection of long-term data on language minority students, for purposes of program evaluation, in that they collect data on more variables than any of our other school districts. The student background variables that they have collected help to clarify these variables' influence on language minority student achievement in the long term.

Variables identified as powerful in these datasets are the number of years of schooling in students' primary language, age on arrival in U.S., and the number of years of development of academic English. These three variables are interrelated, because students need a significant number of years of both primary language schooling and English schooling to do well in school in their second language. Students who arrived in the U.S. at a young age (between birth and age 8) and thus did not receive enough years of primary language (L1) schooling in home country, did less well than those who arrived when they were older and received at least 4-5 years of grade-level L1 schooling.

From datasets in other school districts, we have seen that students can achieve at higher levels in English when they receive primary language schooling in either home country or host country. When students receive dual language schooling in the U.S., they are working on both first and second languages simultaneously, and the result is high achievement in the long term. After analyzing the achievement levels of their ESL Content graduates, District E staff chose to add primary language coursework in their curricular offerings for their most "at risk" groups–young Spanish speakers who did not have access to primary language schooling in their country of origin.

The ESL Content program of District E is a carefully conceived program, taught by highly experienced, certified teachers. Staff development and planning time provided for teachers helps the ESL Content teachers to maximize their opportunities to assist students with their academic English development. The achievement levels that these ESL Content graduates reach (mid 30s in NCEs) are high in comparison to many other school districts utilizing ESL Content as a primary program for English language learners' instruction. Yet without grade-level academic work in primary language while acquiring English, these students get behind in their schooling and it is difficult for them to catch up to the constantly advancing native-English speakers who continue to make another year's progress with each year of school. While these students are attending this exemplary ESL Content program, they make more than one year's progress with each year of schooling, but they do not continue that accelerated level of achievement gain in most subjects after moving into the mainstream, thus the achievement gap with native-English speakers is not closed. In fact, only about half of the total gap in reading achievement is closed by the end of 11th grade. With the added one-way and two-way bilingual services for increasing numbers of Spanish-speaking students, ESL/bilingual staff expect that the academic achievement gap will be fully closed in the long term. As the students in these programs reach the secondary years, future analyses will reveal the results of work toward this goal.

This school district has made a strong commitment to continuing improvement of their educational services for all students. Its long-term goal is to close the academic achievement gap between groups, so that all groups of students will have equal access to educational opportunities beyond high school. When examining student achievement by ethnicity, the two groups with lower achievement levels in District E are African-American students and Hispanic students. Each year, these two groups' achievement levels are rising. Examining the achievement pattern for Hispanic students in this school district over the past decade is instructive; for this school district is representative of the current or near-future demographics of many mid-sized school districts throughout the United States.

As increasing numbers of Hispanic students have arrived in District E, many have experienced difficult life circumstances, due to war or political instability or poverty in the regions from which they have emigrated. Starting life over, these families are risk takers, and with time their children will overcome the life events that led to interrupted schooling and other factors that influence school achievement. The new arrivals also have to acquire the English language to succeed in U.S. schools, and that will take time. It is important to gather achievement data on two separate groups of Hispanics, as this school district has done, seen in Figures E-1 through E-5. One group are those who are language minorities but they were never classified as limited in English proficiency. They entered the school system proficient in English. The other group is each year's new arrivals who are not yet proficient in English, followed year by year to measure their progress over time.

As seen in Figures E-1 through E-5, language minority students (mostly Hispanic) who entered the school system proficient in English are achieving at or above grade level. This is important to know, for it is unrealistic to expect the other group of Hispanic students not yet proficient in English to be scoring on grade level for several years (4 years being the minimum, achieved only by those who received schooling through their two languages). Yet as English language learners move along in school, the school district should measure this group's progress across time as well, with the expectation that they will gradually close the achievement gap with each additional year of schooling in the U.S.

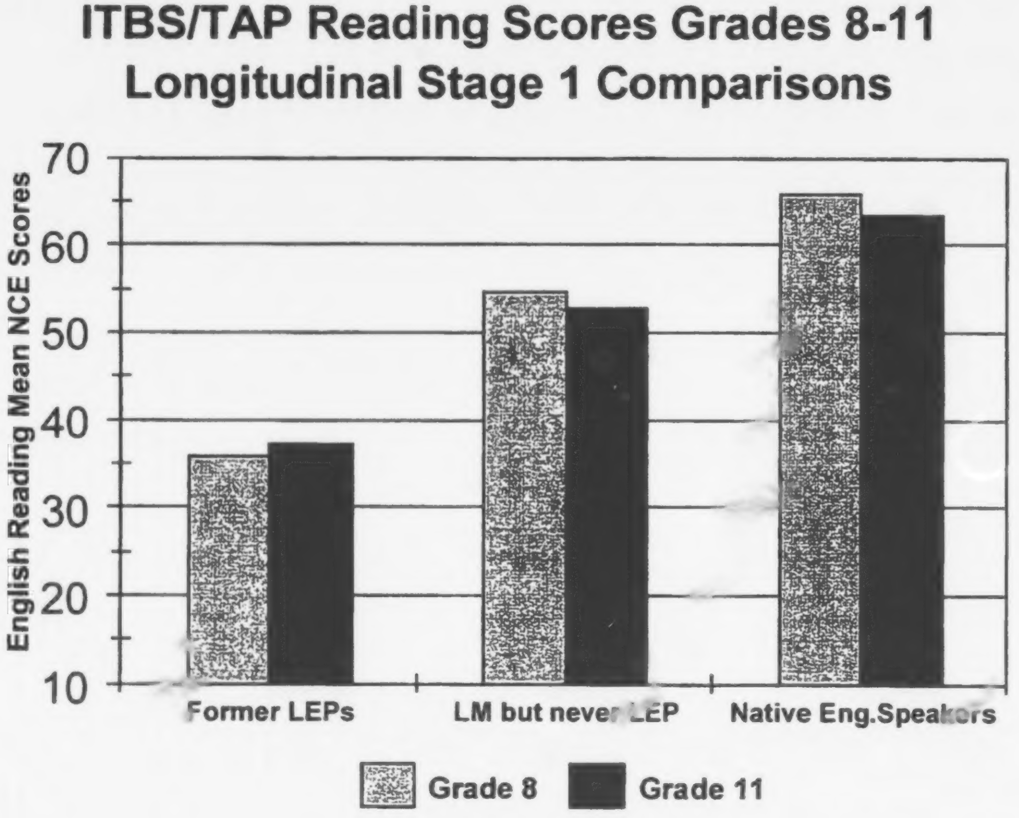
The final figures that we present in this report demonstrate these two groups merged into one group. Figures E-16 through E-19 and Tables E-19 through E-22 show the progress of Hispanic students of District E as a group, between 1989-1991 and 1999-2001. During this decade, Hispanics increased in number in this school district, and more arrived with interrupted formal schooling and less proficiency in English. But despite the challenge of serving many students with greater needs, overall the achievement of Hispanic students is being maintained a decade later. After a drop in Hispanic student achievement in the first half of this decade as a result of the increased needs, scores have then increased with each succeeding year. For example, Hispanic student achievement in Grade 4 on the reading subtest was close to or on grade level in 1989-1990, but after lower achievement for several years, the trend has been a steady increase in achievement with each year from 1999-2001, reaching the 48th NCE by 2001. Math achievement was at or above the 50th percentile for 4th and 8th graders in 1989-1991 and by 2000, Hispanics had reached the 55th NCE in 4th grade and the 58th NCE in 6th grade. Grade 9 students were at the

48th NCE, very close to grade-level performance in 2001. On state assessments, two of the bilingual schools met the state standards in 2001.

As with all of our school districts that served as research sites for this study, District E staff do not claim to have all the answers. But their commitment to better serve their community with each additional year of experience working with diverse student populations has led them to increased student achievement and greater clarity about their long-term goals. Minorities have become the majority of this school district's student population. Now receiving the children of the first immigrants who settled in this community, this school district is clear that closing the achievement gap for all through quality schooling that recognizes and uses the resources that linguistically and culturally diverse students bring to the community will lead to preparation for their own community's future. All their citizens will benefit.

Southeast U.S. Mid-sized Urban Research Site — Figures

Figure E-1
Longitudinal Analyses

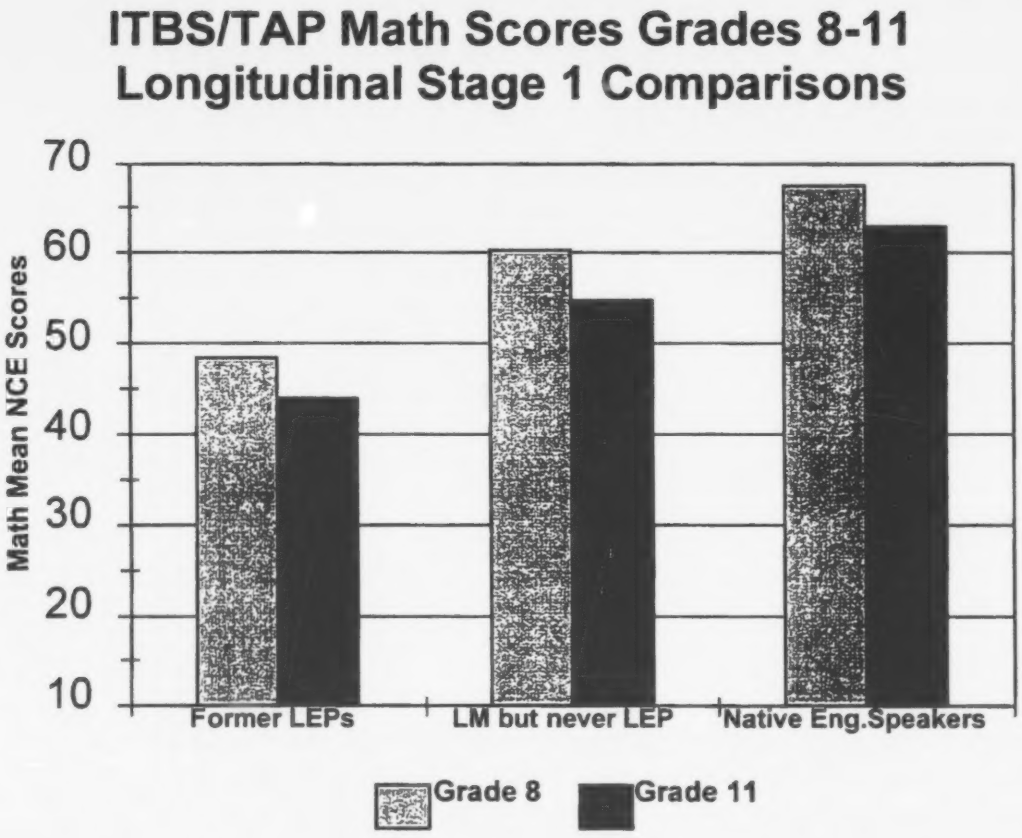


ITBS/TAP Reading Scores Grades 8-11
Longitudinal Stage 1 Comparisons

Former LEPs B Graduates of ESL Content program in mainstream
LM but never LEP B Language minority students in mainstream
who tested proficient in English upon entry in District E
Native-English speakers B Native-English speakers in mainstream

Former LEPs	N = 141
LM but never LEP	N = 342
Native-English speakers	N = 1,360

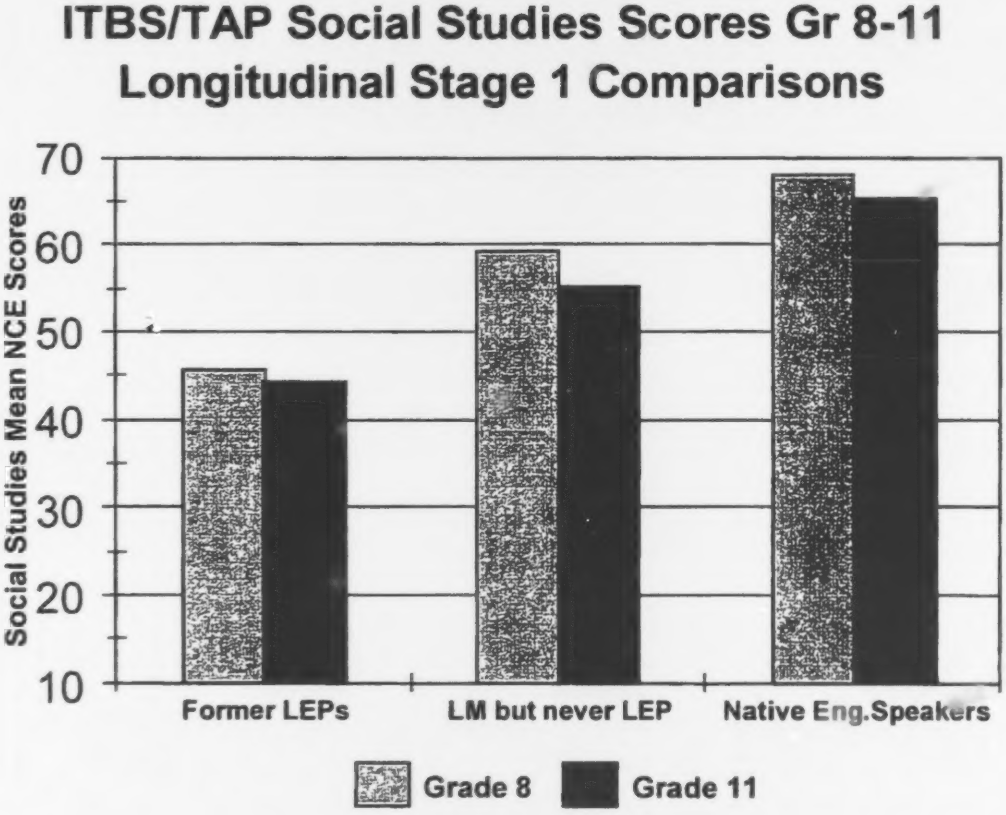
Figure E-2
Longitudinal Analyses



Former LEPs B Graduates of ESL Content program in mainstream
LM but never LEP B Language minority students in mainstream who tested proficient in English upon entry in District E
Native-English speakers B Native-English speakers in mainstream

Former LEPs	N = 140
LM but never LEP	N = 332
Native-English speakers	N = 1,352

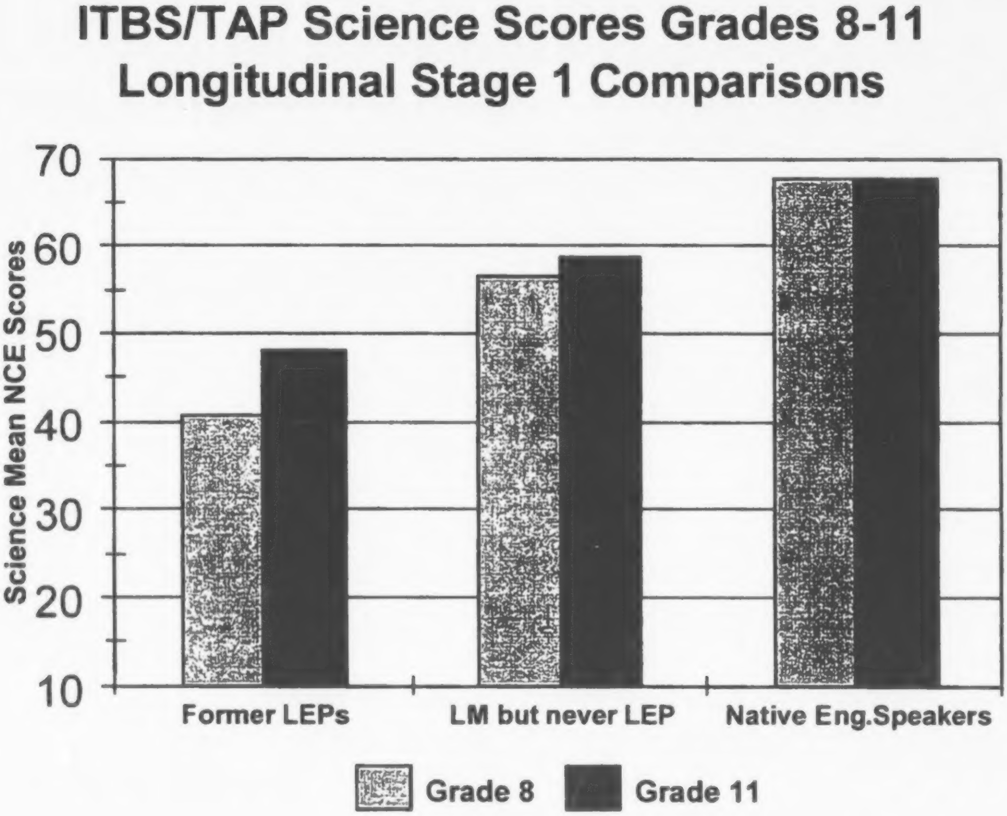
Figure E-3
Longitudinal Analyses



Former LEPs B Graduates of ESL Content program in mainstream
LM but never LEP B Language minority students in mainstream who tested proficient in English upon entry in District E
Native-English speakers B Native-English speakers in mainstream

Former LEPs	N = 136
LM but never LEP	N = 335
Native-English speakers	N = 1,339

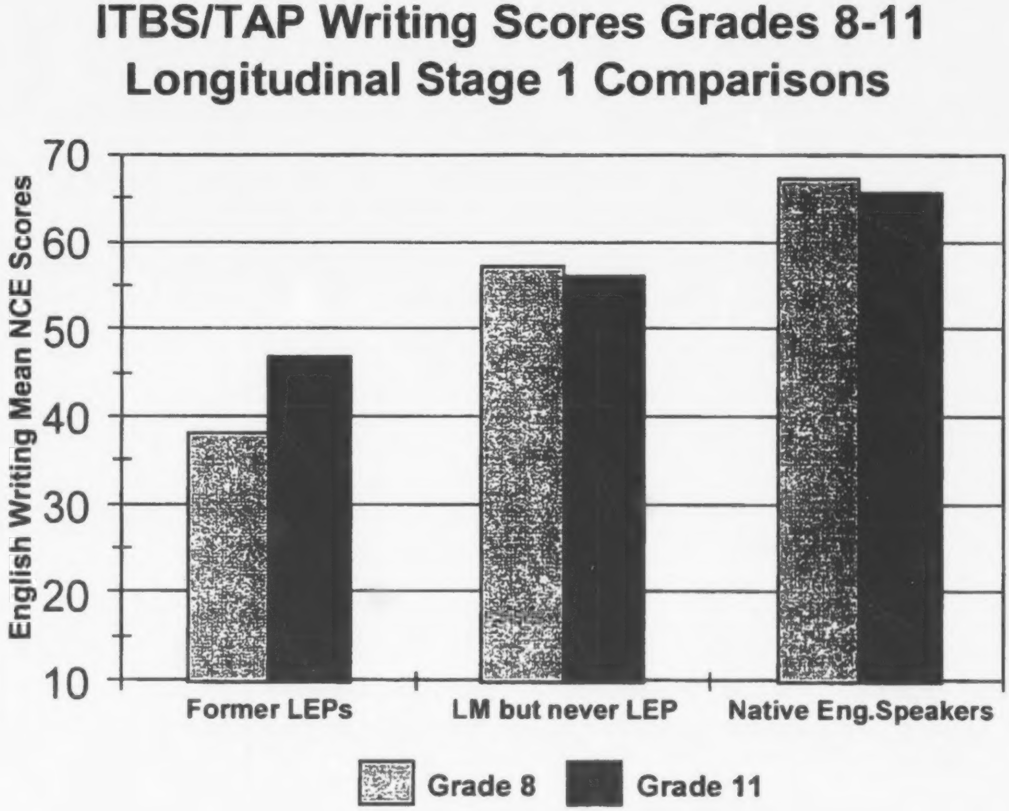
Figure E-4
Longitudinal Analyses



Former LEPs B Graduates of ESL Content program in mainstream
LM but never LEP B Language minority students in mainstream who tested proficient in English upon entry in District E
Native-English speakers B Native-English speakers in mainstream

Former LEPs	N = 136
LM but never LEP	N = 331
Native-English speakers	N = 1,335

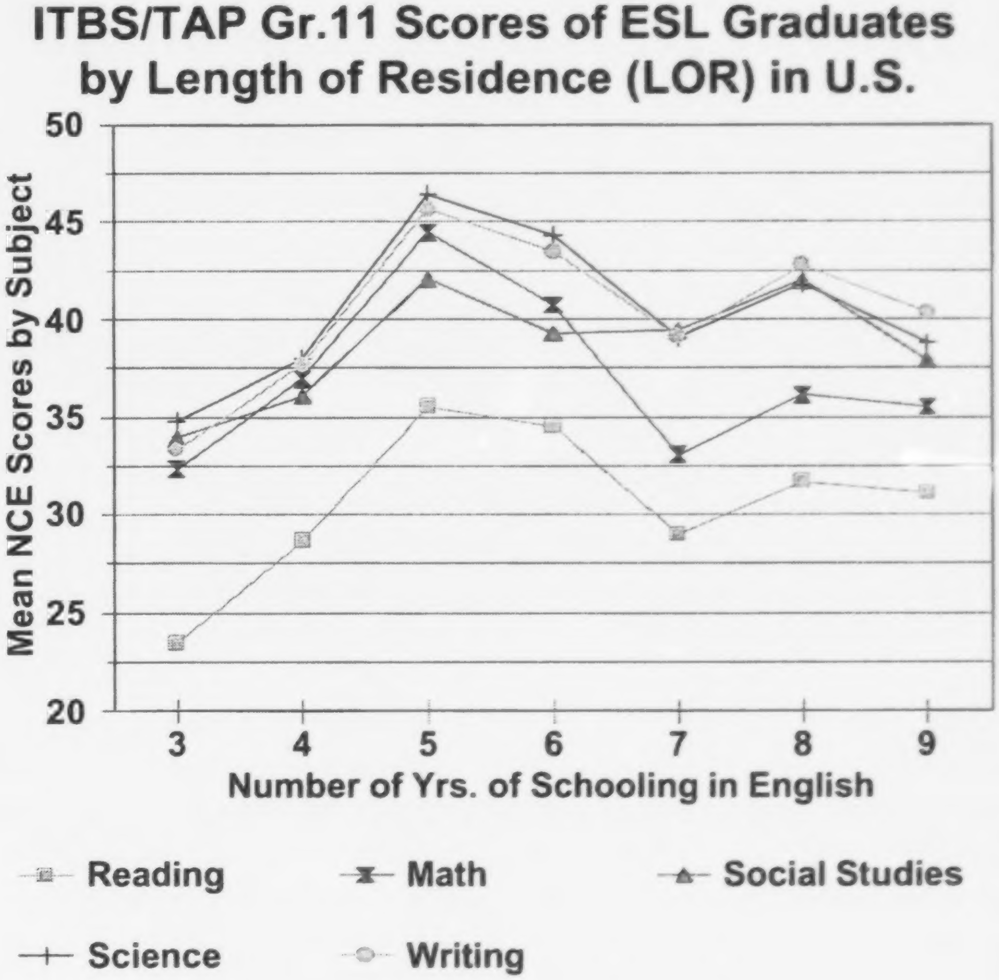
Figure E-5
Longitudinal Analyses



Former LEPs B Graduates of ESL Content program in mainstream
LM but never LEP - Language minority students in mainstream
who tested proficient in English upon entry in District E
Native-English speakers B Native-English speakers in mainstream

Former LEPs	N = 140
LM but never LEP	N = 340
Native-English speakers	N = 1,355

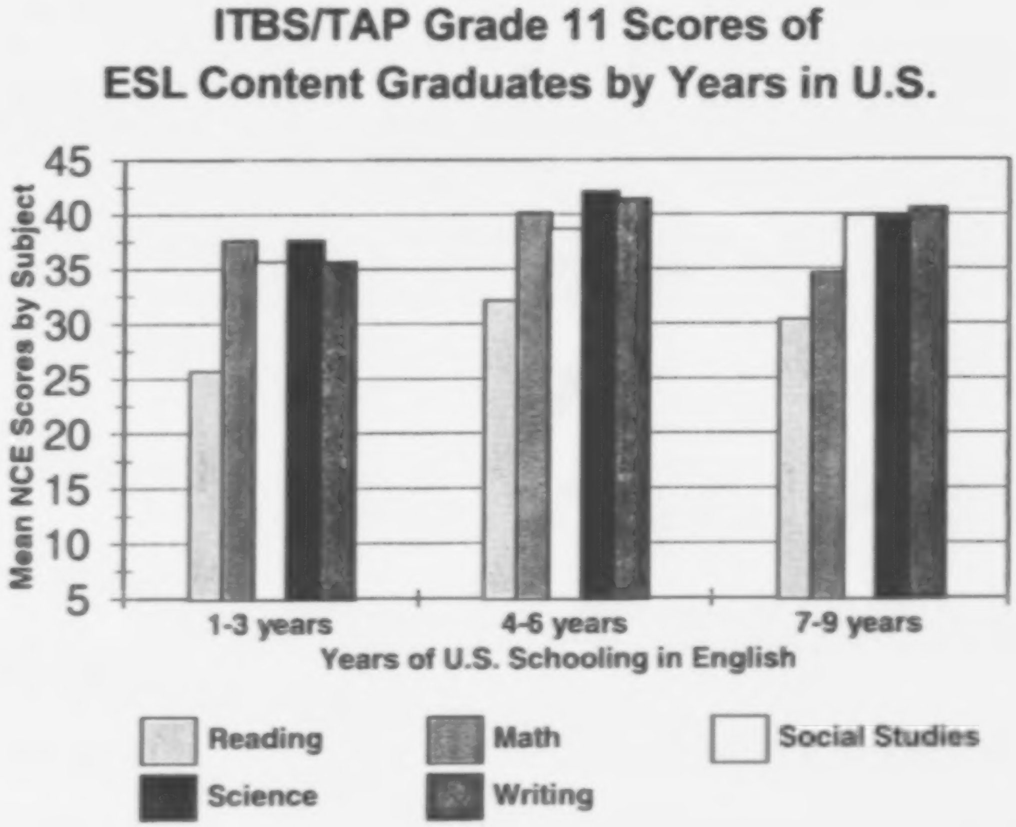
Figure E-6
Quasi-longitudinal analyses



English schooling in U.S. for 3 years; L1 schooling in home country for 7 years	N = 120
English schooling in U.S. for 4 years; L1 schooling in home country for 6 years	N = 96
English schooling in U.S. for 5 years; L1 schooling in home country for 5 years	N = 65
English schooling in U.S. for 6 years; L1 schooling in home country for 4 years	N = 47
English schooling in U.S. for 7 years; L1 schooling in home country for 3 years	N = 38
English schooling in U.S. for 8 years; L1 schooling in home country for 2 years	N = 27
English schooling in U.S. for 9 years; L1 schooling in home country for 1 year	N = 18

(Slight variations in N by subject tested - See Table E-6)

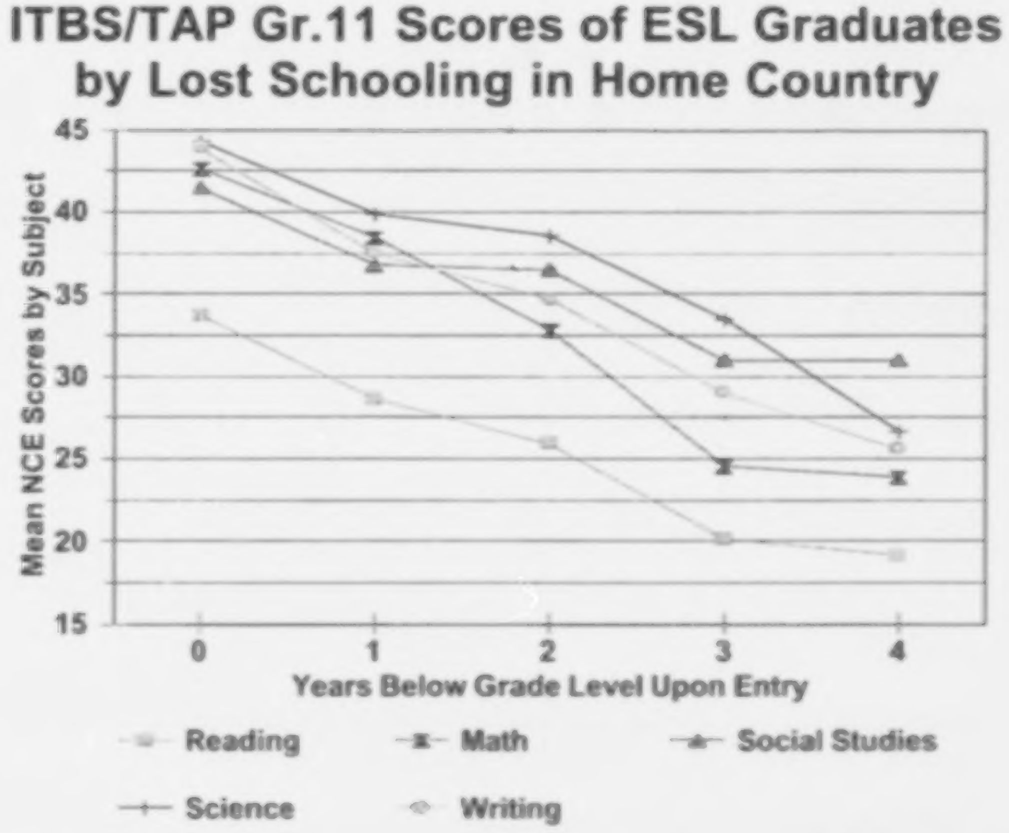
Figure E-7
Quasi-longitudinal analyses



English schooling in U.S. for 1-3 years; L1 schooling in home country for 7-9 years N = 214
English schooling in U.S. for 4-6 years; L1 schooling in home country for 4-6 years N = 208
English schooling in U.S. for 7-9 years; L1 schooling in home country for 1-3 years N = 83

(Slight variations in N by subject tested - See Table E-7)

Figure E-8
Quasi-longitudinal analyses



All of the students in this figure were:

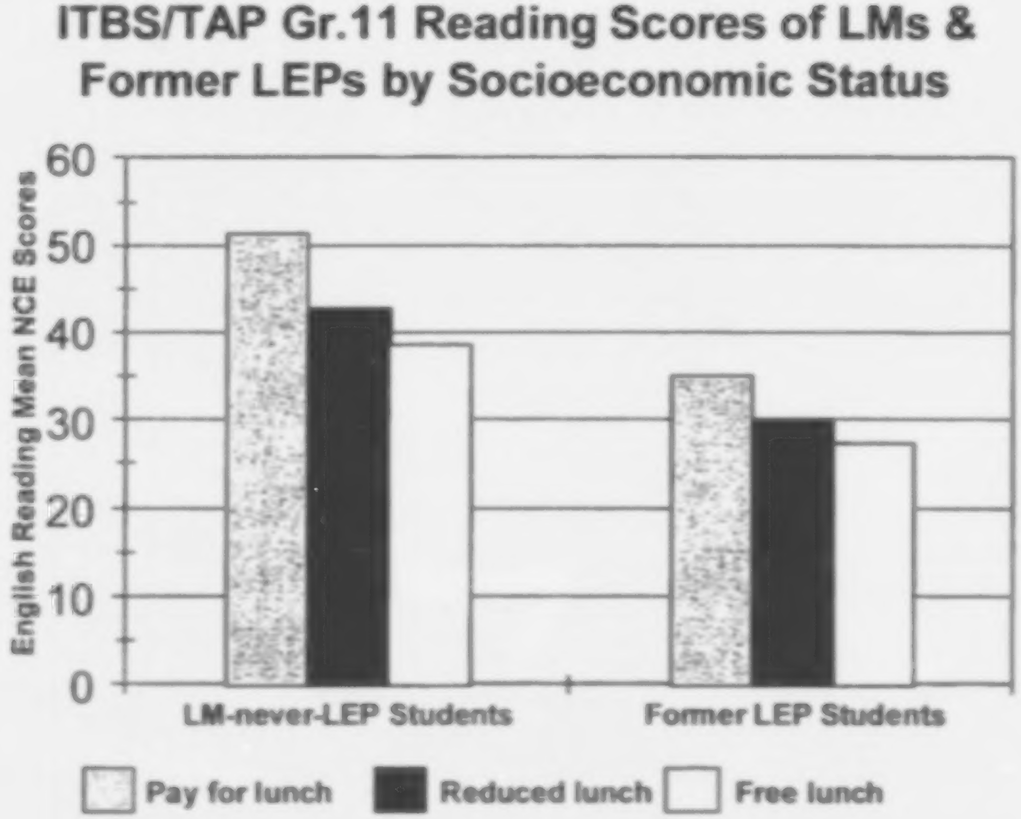
- Spanish speakers
- On free or reduced lunch
- At beginning level of English proficiency upon entry
- Enrolled in the ESL Content program upon entry
- Attended District E for at least 5 years when tested in 11th grade

Years below grade level upon entry:

0 years	N = 182
1 year	N = 118
2 years	N = 74
3 years	N = 26
4 years	N = 23

(Slight variations in N by subject tested - See Table E-8)

Figure E-9
Quasi-longitudinal analyses

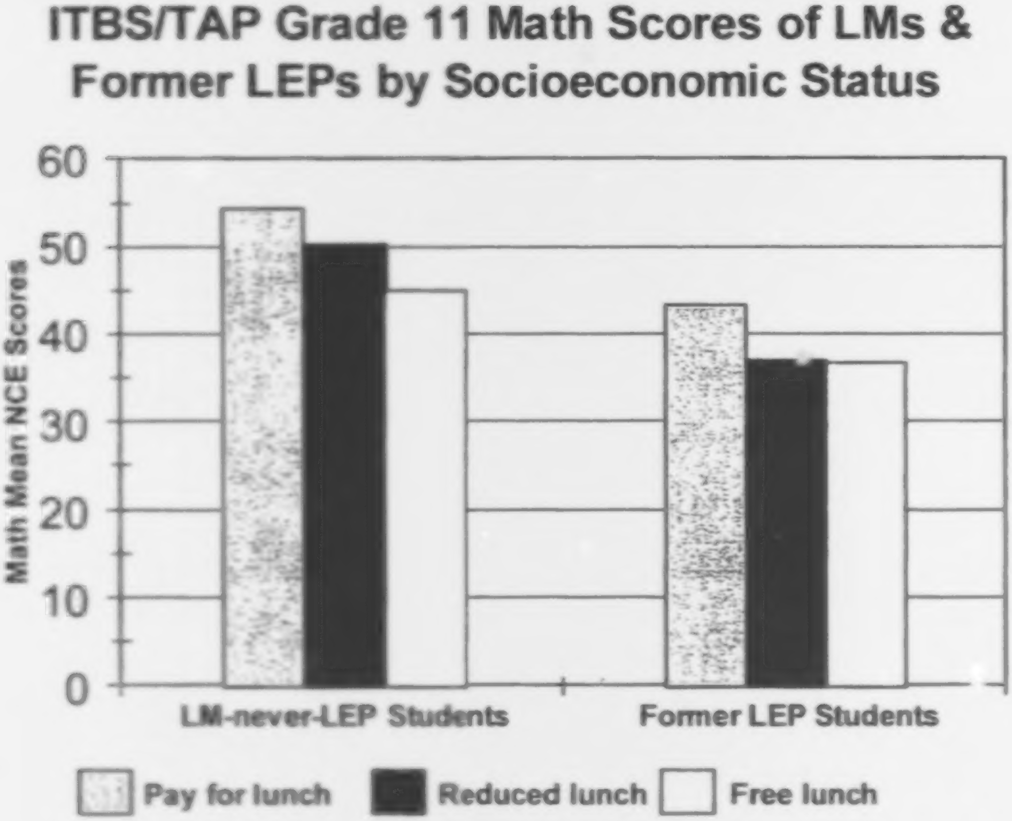


LM-never-LEP Students B Spanish-speaking language minority students in mainstream who tested proficient in English upon entry in District E

Former LEP Students B Spanish-speaking graduates of ESL Content program in mainstream

Language minority students:	Pay for lunch	N = 428
	Reduced lunch	N = 47
	Free lunch	N = 236
Former LEP students:	Pay for lunch	N = 182
	Reduced lunch	N = 70
	Free lunch	N = 268

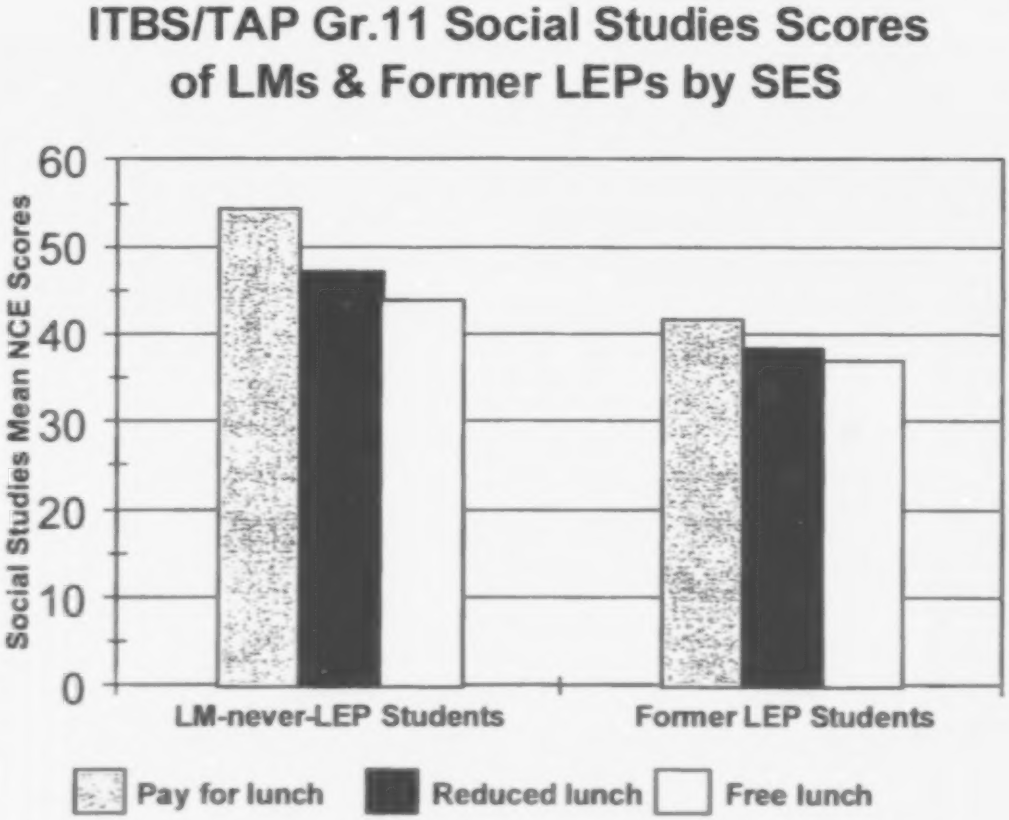
Figure E-10
Quasi-longitudinal analyses



LM-never-LEP Students B Spanish-speaking language minority students in mainstream who tested proficient in English upon entry in District E Former LEP Students B Spanish-speaking graduates of ESL Content program in mainstream

Language minority students:	Pay for lunch	N = 420
	Reduced lunch	N = 47
	Free lunch	N = 236
Former LEP students:	Pay for lunch	N = 180
	Reduced lunch	N = 70
	Free lunch	N = 268

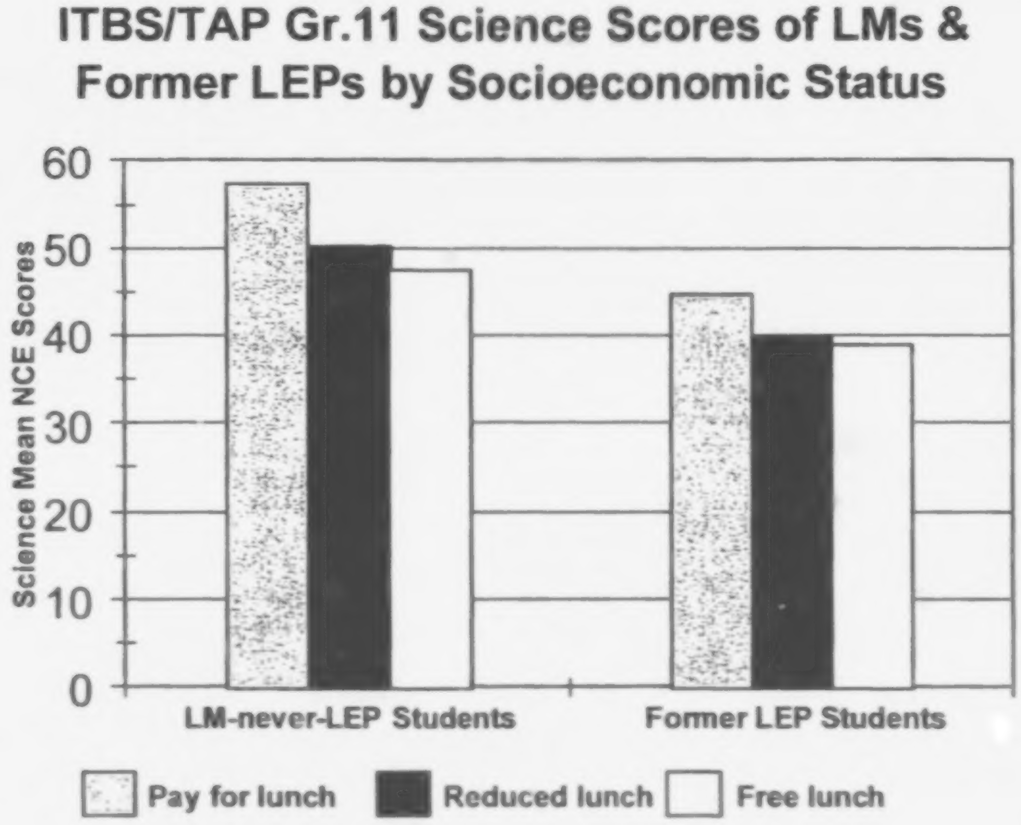
Figure E-11
Quasi-longitudinal analyses



LM-never-LEP Students B Spanish-speaking language minority students in mainstream who tested proficient in English upon entry in District E
Former LEP Students B Spanish-speaking graduates of ESL Content program in mainstream

Language minority students:	Pay for lunch	N = 418
	Reduced lunch	N = 47
	Free lunch	N = 226
Former LEP students:	Pay for lunch	N = 173
	Reduced lunch	N = 70
	Free lunch	N = 260

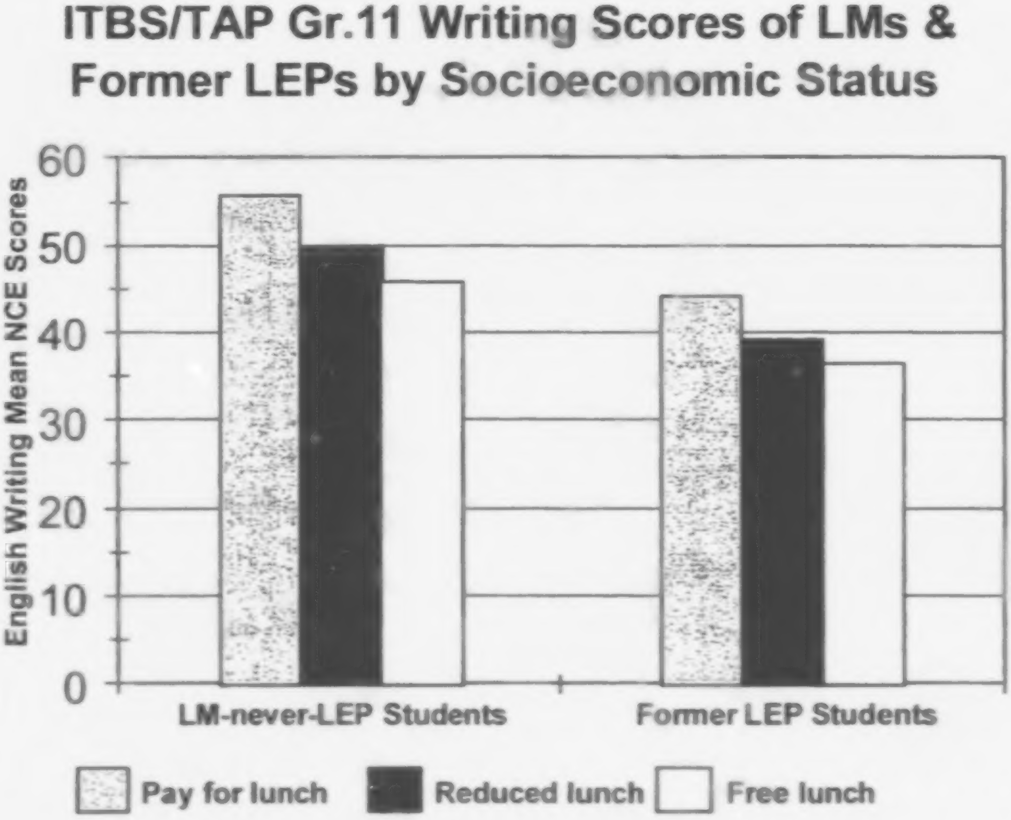
Figure E-12
Quasi-longitudinal analyses



LM-never-LEP Students B Spanish-speaking language minority students in mainstream who tested proficient in English upon entry in District E
Former LEP Students B Spanish-speaking graduates of ESL Content program in mainstream

Language minority students:	Pay for lunch	N = 419
	Reduced lunch	N = 46
	Free lunch	N = 226
Former LEP students:	Pay for lunch	N = 172
	Reduced lunch	N = 70
	Free lunch	N = 258

Figure E-13
Quasi-longitudinal analyses

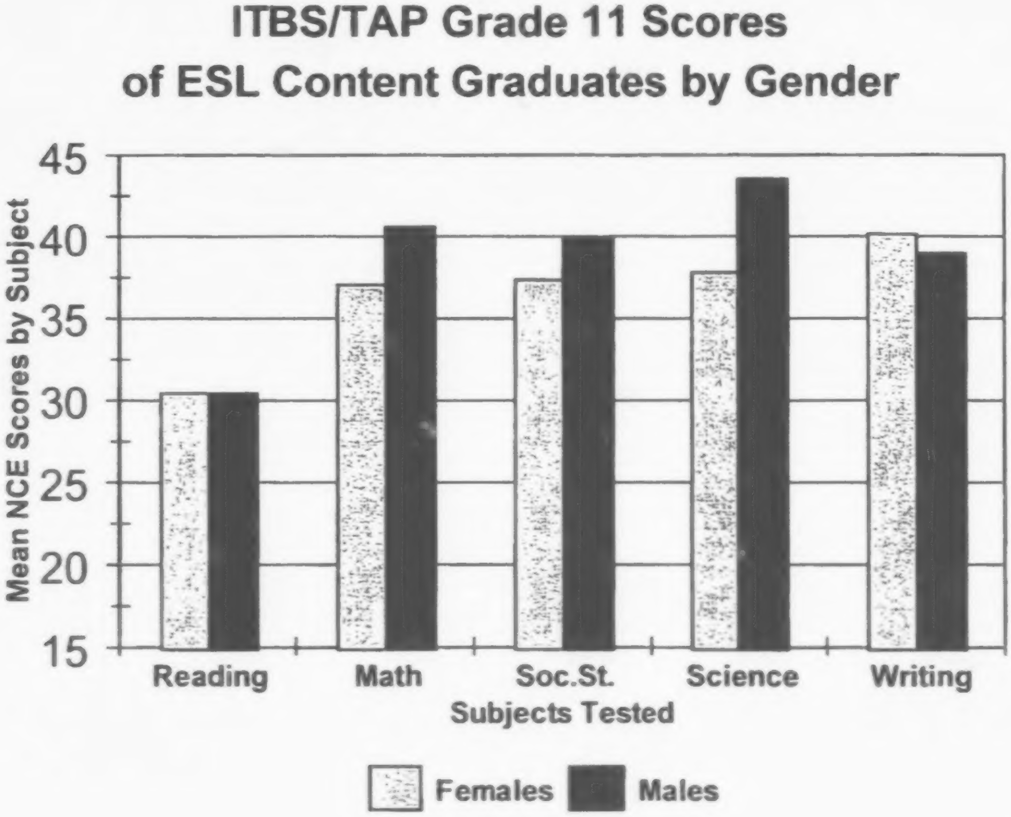


LM-never-LEP Students B Spanish-speaking language minority students in mainstream who tested proficient in English upon entry in District E Former LEP Students B Spanish-speaking graduates of ESL Content program in mainstream

Language minority students:	Pay for lunch	N = 424
	Reduced lunch	N = 47
	Free lunch	N = 230
Former LEP students:	Pay for lunch	N = 178
	Reduced lunch	N = 70
	Free lunch	N = 265

Figure E-14
Quasi-longitudinal analyses

All of the students in this figure were:

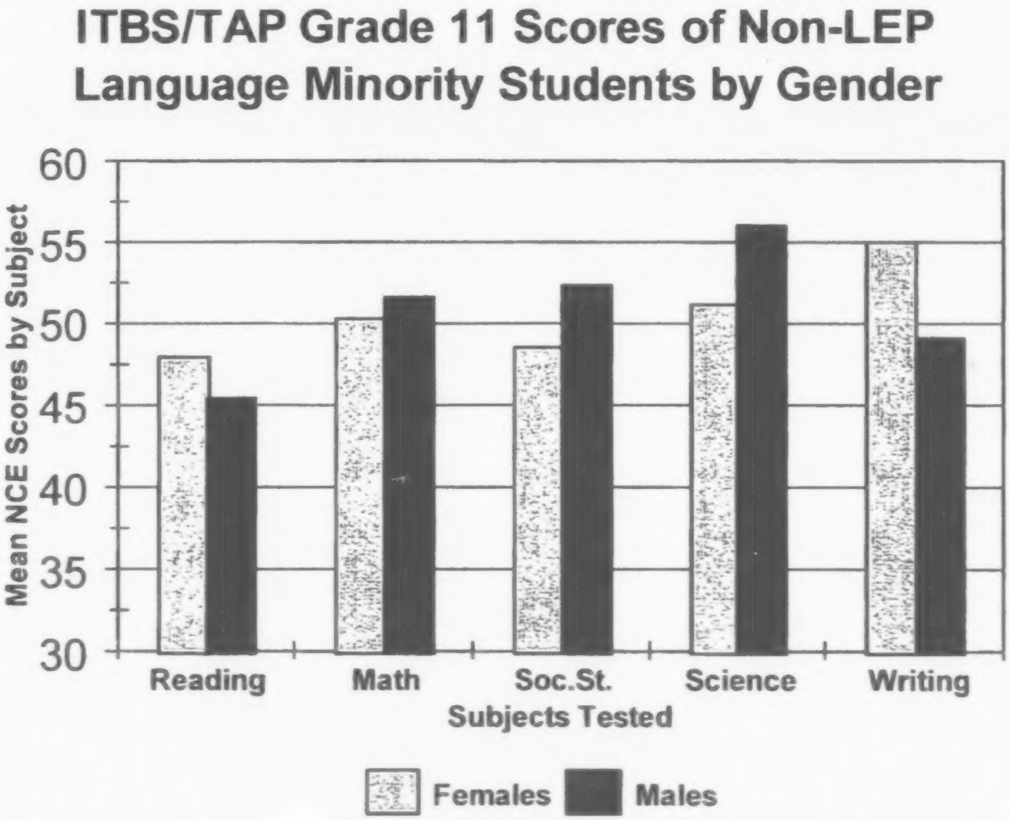


Spanish speakers
At beginning level of English proficiency upon entry
Enrolled in the ESL Content program upon entry
Attended District E for at least 5 years when tested in 11th grade

Females	N = 230
Males	N = 290

(Slight variations in N by subject tested - See Table E-14)

Figure E-15
Quasi-longitudinal analyses

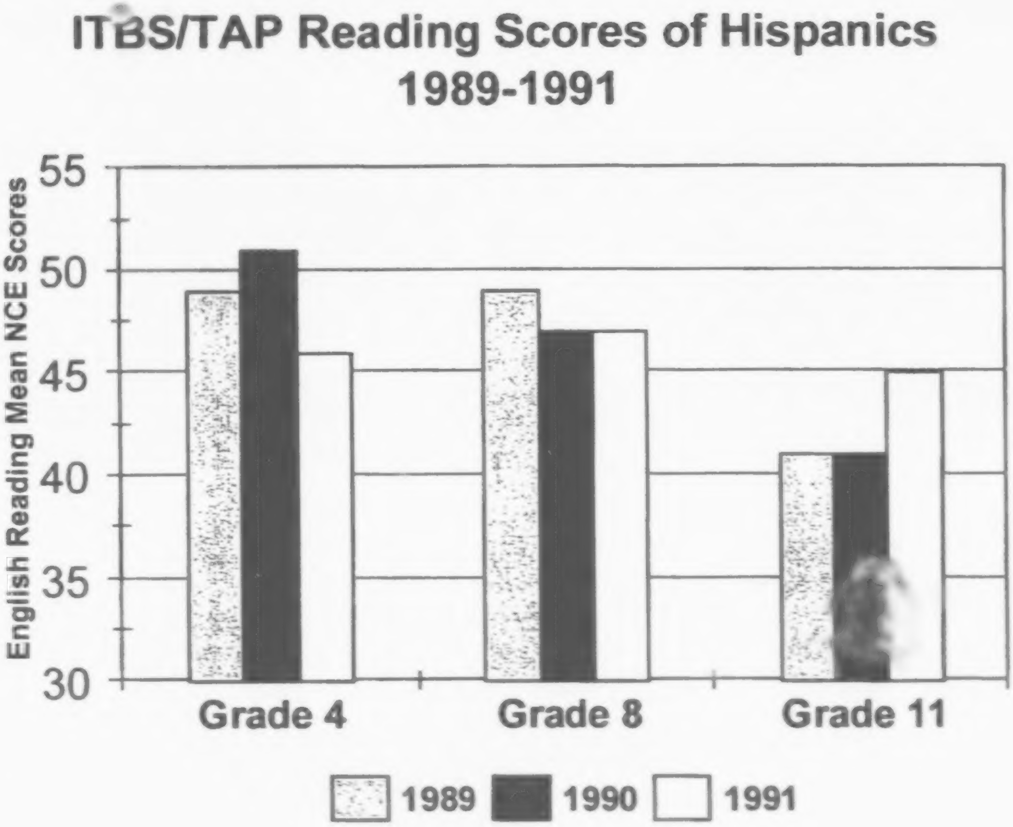


All of the students in this figure were:
Spanish-speaking language minority students in mainstream who tested proficient in English upon entry in District E

Females	N = 351
Males	N = 360

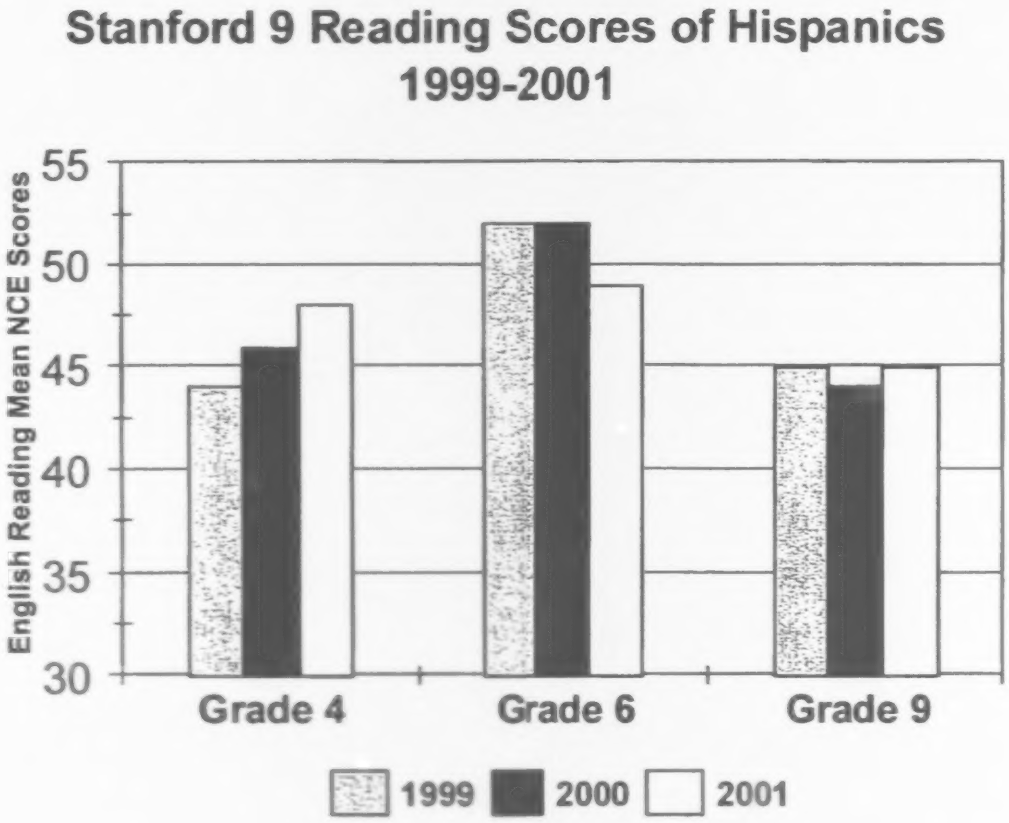
(Slight variations in N by subject tested - See Table E-15)

Figure E-16
Cross-sectional analyses



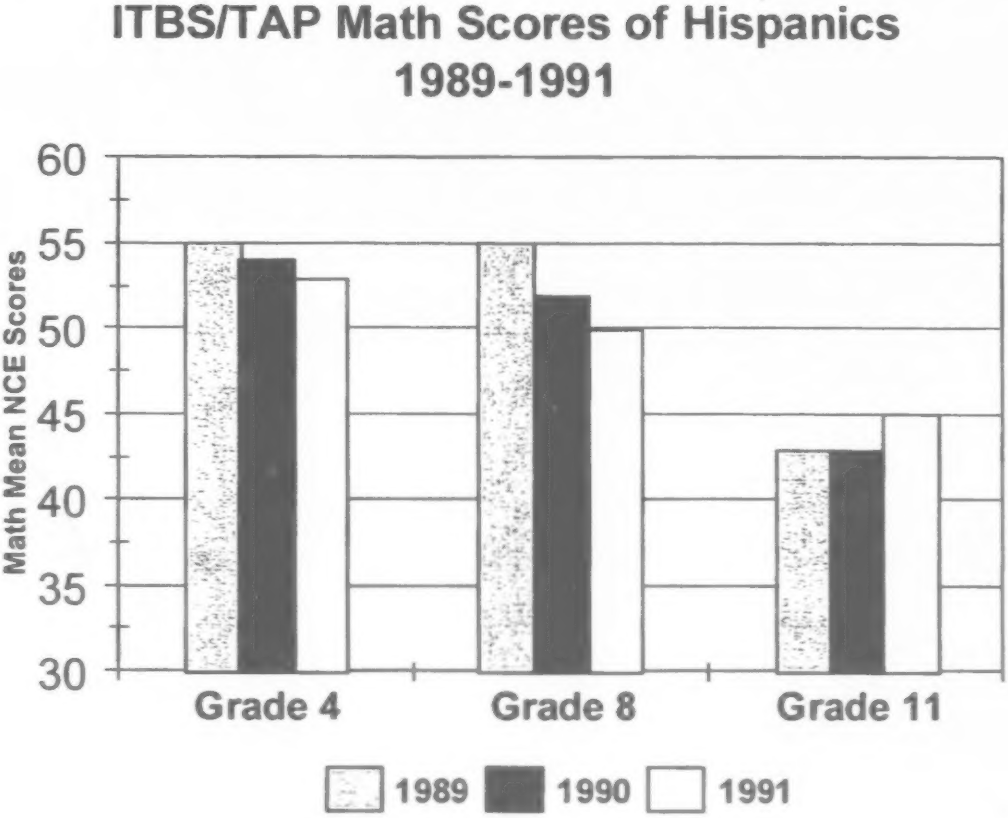
Grade 4:		Grade 8:		Grade 11:	
1989	N = 117	1989	N = 93	1989	N = 102
1990	N = 127	1990	N = 130	1990	N = 113
1991	N = 160	1991	N = 138	1991	N = 106

Figure E-17
Cross-sectional analyses



Grade 4:	Grade 6:	Grade 9:
1999 N = 178	1999 N = 238	1999 N = 255
2000 N = 172	2000 N = 226	2000 N = 315
2001 N = 213	2001 N = 226	2001 N = 248

Figure E-18
Cross-sectional analyses



Grade 4:		Grade 8:		Grade 11:	
1989	N = 117	1989	N = 93	1989	N = 102
1990	N = 127	1990	N = 130	1990	N = 113
1991	N = 160	1991	N = 138	1991	N = 106

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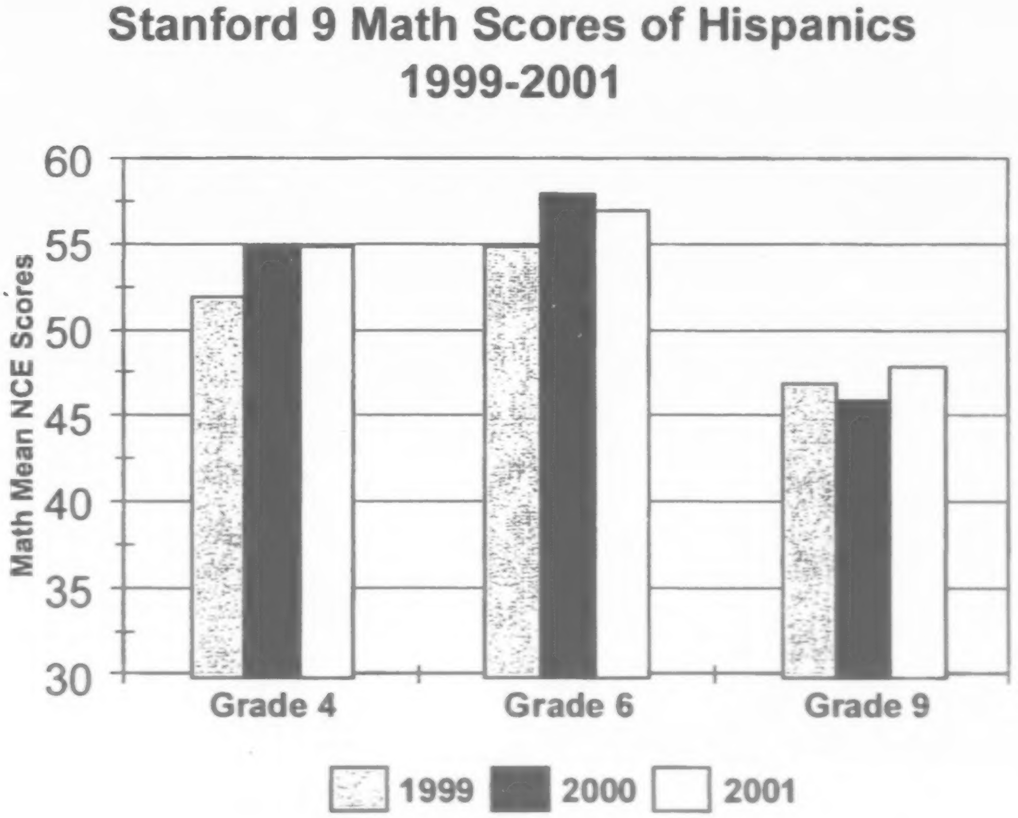
Figure E-19
Cross-sectional analyses



Grade 4:		Grade 6:		Grade 9:	
1999	N = 178	1999	N = 238	1999	N = 255
2000	N = 172	2000	N = 226	2000	N = 315
2001	N = 213	2001	N = 226	2001	N = 248

Southeast U.S. Mid-sized Urban Research Site — Tables

Table E-1
English Reading Mean NCE Scores on the ITBS/TAP for ESL Content Graduates in Grades 8-11: Longitudinal Analyses

Student Type		Grade 8 NCE Scores Total Reading	Grade 11 NCE Scores Total Reading
Former LEP Students	Mean	35.99	37.33
	N	141	141
	Std. Deviation	14.28	15.86
LM-but-never LEP Students	Mean	54.68	52.89
	N	342	342
	Std. Deviation	17.76	17.01
Native-English-Speaking Students	Mean	65.90	63.44
	N	1360	1360
	Std. Deviation	20.45	20.19
Total	Mean	61.53	59.49
	N	1843	1843
	Std. Deviation	21.34	20.75

Table E-2
Mathematics Mean NCE Scores on the ITBS/TAP for ESL Content Graduates in Grades 8-11: Longitudinal Analyses

Student Type		Grade 8 NCE Scores Total Math	Grade 11 NCE Scores Total Math
Former LEP Students	Mean	48.69	43.94
	N	140	140
	Std. Deviation	19.68	20.97
LM-but never LEP Students	Mean	60.55	54.99
	N	332	332
	Std. Deviation	18.65	18.87
Native-English-Speaking Students	Mean	67.59	63.06
	N	1352	1352
	Std. Deviation	19.60	20.94
Total	Mean	64.86	60.12
	N	1824	1824
	Std. Deviation	20.16	21.32

Table E-3
Social Studies Mean NCE Scores on the ITBS/TAP for ESL Content Graduates in Grades 8-11: Longitudinal Analyses

Student Type		Grade 8 NCE Scores Social Studies	Grade 11 NCE Scores Social Studies
Former LEP Students	Mean	45.89	44.35
	N	136	136
	Std. Deviation	15.87	14.37
LM-but-never LEP Students	Mean	59.48	55.31
	N	335	335
	Std. Deviation	18.01	16.97
Native-English-Students	Mean	68.29	65.33
	N	1339	1339
	Std. Deviation	20.05	19.07
Total	Mean	64.97	61.9
	N	1810	1810
	Std. Deviation	20.42	19.43

Table E-4
Science Mean NCE Scores on the ITBS/TAP for ESL Content Graduates in Grades 8-11: Longitudinal Analyses

Student Type		Grade 8 NCE Scores Science	Grade 11 NCE Scores Science
Former LEP Students	Mean	40.92	48.09
	N	136	136
	Std. Deviation	17.4	16.23
LM-but-never-LEP Students	Mean	56.75	58.79
	N	331	331
	Std. Deviation	16.55	17.29
Native-English-Students	Mean	67.75	67.88
	N	1335	1335
	Std. Deviation	18.1	19.89
Total	Mean	63.7	64.71
	N	1802	1802
	Std. Deviation	19.39	20.05

Table E-5
Writing Mean NCE Scores on the ITBS/TAP for ESL Content Graduates in Grades 8-11: Longitudinal Analyses

Student Type		Grade 8 NCE Scores Writing	Grade 11 NCE Scores Writing
Former LEP Students	Mean	38.36	46.84
	N	140	140
	Std. Deviation	14.49	17.39
LM-but-never-LEP Students	Mean	57.24	56.31
	N	340	340
	Std. Deviation	16.88	18.06
Native-English-Speaking Students	Mean	67.44	65.87
	N	1355	1355
	Std. Deviation	19.26	18.93
Total	Mean	63.33	62.65
	N	1835	1835
	Std. Deviation	20.24	19.55

Table E-6
ITBS/TAP Grade 11 Mean NCE Scores for ESL Content Graduates by Subject and by Length of Residence (LOR) in the U.S.: Quasi-longitudinal analyses

Number of Years of Schooling in English		Grade 11 NCE Scores Total Reading	Grade 11 NCE Scores Total Math	Grade 11 NCE Scores Social Studies	Grade 11 NCE Scores Science	Grade 11 NCE Scores Writing
3 years	Mean	23.45	32.33	33.92	34.82	33.32
	N	120	119	118	119	119
	Std. Deviation	15.17	18.94	13.67	16.27	15.58
4 years	Mean	28.65	36.95	36.05	38.02	37.67
	N	96	96	95	94	97
	Std. Deviation	16.99	20.5	15.08	17.25	19.59
5 years	Mean	35.54	44.46	42.08	46.47	45.65
	N	65	65	65	64	63
	Std. Deviation	18.6	23.29	15.65	20.08	20.56
6 years	Mean	34.49	40.72	39.28	44.35	43.46
	N	47	47	46	46	46
	Std. Deviation	15.03	20.75	15.98	16.51	20.03
7 years	Mean	29	33.08	39.42	39.06	39.11
	N	38	37	36	36	36
	Std. Deviation	15.44	20.63	14.68	19.51	17.44
8 years	Mean	31.7	36.11	41.96	41.8	42.78
	N	27	27	25	25	27
	Std. Deviation	16.33	20.43	11.93	14.06	16.87
9 years	Mean	31.11	35.5	37.89	38.78	40.33
	N	18	18	18	18	18
	Std. Deviation	14.04	16.72	13.59	15.16	13.13

Table E-7

ITBS/TAP Grade 11 Mean NCE Scores for ESL Content Graduates by Subject and by Years of Schooling in the U.S., Grouped by 1-3, 4-6, and 7-9 years of English Schooling: Quasi-longitudinal analyses

Number of Years of Schooling in English		Grade 11 NCE Scores Total Reading	Grade 11 NCE Scores Total Math	Grade 11 NCE Scores Social Studies	Grade 11 NCE Scores Science	Grade 11 NCE Scores Writing
1-3 years	Mean	25.64	37.64	35.67	37.65	35.68
	N	214	214	212	213	213
	Std. Deviation	14.85	20.02	12.88	16.36	15.57
4-6 years	Mean	32.12	40.15	38.67	42.1	41.4
	N	208	208	206	204	206
	Std. Deviation	17.33	21.61	15.61	18.35	20.22
7-9 years	Mean	30.34	34.61	39.87	39.86	40.6
	N	83	82	79	79	81
	Std. Deviation	15.32	19.59	13.53	16.84	16.27
Total	Mean	29.08	38.18	37.58	39.83	38.84
	N	505	504	497	496	500
	Std. Deviation	16.24	20.68	14.25	17.37	17.91

Table E-8

ITBS/TAP Grade 11 Mean NCE Scores for ESL Content Graduates by Subject and by Lost Schooling in Home Country: Quasi-longitudinal analyses

Number of Years of Lost Schooling In Home Country		Grade 11 NCE Scores Total Reading	Grade 11 NCE Scores Total Math	Grade 11 NCE Scores Social Studies	Grade 11 NCE Scores Science	Grade 11 NCE Scores Writing
0 years	Mean	33.69	42.64	41.44	44.26	43.88
	N	182	180	176	175	179
	Std. Deviation	14.68	20.72	14.04	17.9	16.87
1 year	Mean	28.6	38.43	36.8	39.87	37.5
	N	118	118	113	112	117
	Std. Deviation	12.5	17.71	10.31	14.04	16.16
2 years	Mean	25.92	32.78	36.51	38.53	34.66
	N	74	74	73	73	73
	Std. Deviation	14.32	19.1	11.71	14.12	15.34
3 years	Mean	20.12	24.54	30.96	33.48	29
	N	26	26	25	25	26
	Std. Deviation	9.83	14.1	9.85	15.78	10.94
4 years	Mean	19.13	23.87	31	26.59	25.57
	N	23	23	22	22	23
	Std. Deviation	14.77	20.14	13.98	17.72	17.18
Total	Mean	29.28	37.59	38.08	40.41	38.55
	N	423	421	409	407	418
	Std. Deviation	14.48	20.08	12.86	16.67	16.96

Table E-9
ITBS/TAP Grade 11 English Reading Mean NCE Scores of Language Minority Students and Former Limited-English-Proficient Students by Socioeconomic Status: Quasi-longitudinal analyses

Student Type	Socioeconomic Status as measured by Paid, Reduced, or Free Lunch	Mean	Number of Students	Standard Deviation
Former LEP Students	Pay for lunch	35.14	182	16.82
	Reduced lunch	30.26	70	15.01
	Free lunch	27.47	268	12.96
	Total	30.53	520	15.08
LM-but-never-LEP Students	Pay for lunch	51.59	428	17.84
	Reduced lunch	42.81	47	15.59
	Free lunch	38.87	236	17.17
	Total	46.79	711	18.45
Total	Pay for lunch	46.68	610	19.08
	Reduced lunch	35.3	117	16.39
	Free lunch	32.81	504	16.1
	Total	39.92	1231	18.9

Table E-10
ITBS/TAP Grade 11 Mathematics Mean NCE Scores of Language Minority Students and Former Limited-English-Proficient Students by Socioeconomic Status: Quasi-longitudinal analyses

Student Type	Socioeconomic Status as measured by Paid, Reduced, or Free Lunch	Mean	Number of Students	Standard Deviation
Former LEP Students	Pay for lunch	43.47	180	22.2
	Reduced lunch	36.99	70	18.62
	Free lunch	36.84	268	18.77
	Total	39.16	518	20.22
LM-but-never-LEP Students	Pay for lunch	54.59	420	19.71
	Reduced lunch	50.34	47	19.61
	Free lunch	45.12	236	19.01
	Total	51.13	703	19.94
Total	Pay for lunch	51.25	600	21.1
	Reduced lunch	42.35	117	20.05
	Free lunch	40.72	504	19.31
	Total	46.05	1221	20.9

Table E-11

ITBS/TAP Grade 11 Social Studies Mean NCE Scores of Language Minority Students and Former Limited-English-Proficient Students by Socioeconomic Status: Quasi-longitudinal analyses

Student Type	Socioeconomic Status as measured by Paid, Reduced, or Free Lunch	Mean	Number of Students	Standard Deviation
Former LEP Students	Pay for lunch	41.86	173	15.57
	Reduced lunch	38.46	70	13.51
	Free lunch	37.03	260	11.97
	Total	38.89	503	13.67
LM-but-never-LEP Students	Pay for lunch	54.49	418	17.17
	Reduced lunch	47.3	47	14.31
	Free lunch	44.05	226	16.25
	Total	50.59	691	17.38
Total	Pay for lunch	50.79	591	17.67
	Reduced lunch	42.01	117	14.45
	Free lunch	40.29	486	14.54
	Total	45.66	1194	16.93

Table E-12
ITBS/TAP Grade 11 Science Mean NCE Scores of Language Minority Students and Former Limited-English-Proficient Students by Socioeconomic Status: Quasi-longitudinal analyses

Student Type	Socioeconomic Status as measured by Paid, Reduced, or Free Lunch	Mean	Number of Students	Standard Deviation
Former LEP Students	Pay for lunch	44.95	172	19
	Reduced lunch	39.77	70	14.81
	Free lunch	38.93	258	15.52
	Total	41.12	500	16.91
LM-but-never-LEP Students	Pay for lunch	57.35	419	18.58
	Reduced lunch	50.28	46	17.85
	Free lunch	47.7	226	19.05
	Total	53.72	691	19.21
Total	Pay for lunch	53.74	591	19.52
	Reduced lunch	43.94	116	16.82
	Free lunch	43.03	484	17.79
	Total	48.43	1191	19.3

Table E-13
ITBS/TAP Grade 11 Writing Mean NCE Scores of Language Minority Students and Former Limited-English-Proficient Students by Socioeconomic Status: Quasi-longitudinal analyses

Student Type	Socioeconomic Status as measured by Paid, Reduced, or Free Lunch	Mean	Number of Students	Standard Deviation
Former LEP Students	Pay for lunch	44.38	178	17.61
	Reduced lunch	39.24	70	18.48
	Free lunch	36.54	265	15.77
	Total	39.63	513	17.15
LM-but-never-LEP Students	Pay for lunch	55.81	424	18.67
	Reduced lunch	49.96	47	18.65
	Free lunch	45.83	230	19.26
	Total	52.14	701	19.4
Total	Pay for lunch	52.43	602	19.07
	Reduced lunch	43.55	117	19.21
	Free lunch	40.85	495	18.06
	Total	46.86	1214	19.48

Table E-14
ITBS/TAP Grade 11 Mean NCE Scores of ESL Content Graduates by Gender: Quasi-longitudinal analyses

Gender		Grade 11 NCE Scores Total Reading	Grade 11 NCE Scores Total Math	Grade 11 NCE Scores Social Studies	Grade 11 NCE Scores Science	Grade 11 NCE Scores Writing
Females	Mean	30.5	37.15	37.48	37.89	40.22
	N	230	228	224	224	227
	Std. Deviation	15.52	20.49	11.69	15.21	17.98
Males	Mean	30.55	40.74	40.02	43.74	39.16
	N	290	290	279	276	286
	Std. Deviation	14.75	19.9	15	17.77	16.49
Total	Mean	30.53	39.16	38.89	41.12	39.63
	N	520	518	503	500	513
	Std. Deviation	15.08	20.22	13.67	16.91	17.15

Table E-15
ITBS/TAP Grade 11 Mean NCE Scores of Non-LEP Language Minority Students by Gender: Quasi-longitudinal analyses

Gender		Grade 11 NCE Scores Total Reading	Grade 11 NCE Scores Total Math	Grade 11 NCE Scores Social Studies	Grade 11 NCE Scores Science	Grade 11 NCE Scores Writing
Females	Mean	48.08	50.46	48.68	51.33	55.07
	N	351	346	345	344	349
	Std. Deviation	19.32	20.43	16.61	19.13	19.9
Males	Mean	45.53	51.77	52.49	56.09	49.24
	N	360	357	346	347	352
	Std. Deviation	17.5	19.46	17.93	19.02	18.47
Total	Mean	46.79	51.13	50.59	53.72	52.14
	N	711	703	691	691	701
	Std. Deviation	18.45	19.94	17.38	19.21	19.4

Table E-16
Hierarchical Linear Regression Analyses: Effects of Years of Prior Schooling (YRSCH_IN), Socioeconomic Status (SES1, SES2), Gender (GENDER_D), Years of Lost Schooling (YD_IN), Years of Schooling in English (LOR_YR_T), Age on Arrival (AOA_YR), and Grade Completed in Prior Schooling (GCOMP_N) on Change in Former LEP Student Achievement between Grades 8-11

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.624	.390	.384	12.74	.390	74.010	1	116	.000
2	.693	.481	.438	12.18	.091	2.373	8	108	.021

Model 1: Predictors: (Constant), NCRCOM8 (Students' ITBS 8th grade NCE scores in Total Reading)

Model 2: Predictors: (Constant), NCRCOM8, YRSCH_IN, SES2, GENDER_D, YD_IN, SES1, LOR_YR_T, AOA_YR, GCOMP_N

Coefficients

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	Upper Bound
1	(Constant)	10.739	3.082		3.485	.001	4.635	16.842
	NCRCOM8	.704	.082	.624	8.603	.000	.542	.866
2	(Constant)	-1.991	29.657		-.067	.947	-60.776	56.794
	NCRCOM8	.680	.082	.603	8.318	.000	.518	.842
	SES1	-2.216	2.485	-.068	-.892	.375	-7.141	2.710
	SES2	-8.998	3.837	-.174	-2.345	.021	-16.604	-1.392
	YRSCH_IN	-.987	2.430	-.118	-.406	.685	-5.803	3.829
	LOR_YR_T	.309	1.723	.035	.179	.858	-3.105	3.724
	AOA_YR	.701	1.728	.080	.406	.686	-2.724	4.126
	GENDER_D	.647	2.298	.020	.281	.779	-3.909	5.202
	YD_IN	-1.393	1.333	-.083	-1.046	.298	-4.035	1.248
	GCOMP_N	2.556	2.267	.304	1.127	.262	-1.938	7.049

a Dependent Variable: NCREAD11 (Students' ITBS/TAP 11th grade NCE scores in Total Reading)

Table E-17

Hierarchical Linear Regression Analyses: Effects of Grade Completed in Prior Schooling (GCOMP_N), Socioeconomic Status (SES2, SES1), Gender (GENDER_D), Years of Lost Schooling (YD_IN), Years of Schooling in English (LOR_YR_T), Age on Arrival (AOA_YR), and Years of Prior Schooling (YRSCH_IN) on Change in Former LEP Student Achievement between Grades 8-11

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.392	.154	.138	14.41	.154	9.897	8	435	.000

Model 1: Predictors: (Constant), GCOMP_N, SES2, GENDER_D, YD_IN, SES1, LOR_YR_T, AOA_YR, YRSCH_IN

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	59.055	13.190		4.477	.000	33.131	84.980
	SES1	-5.555	1.544	-.178	-3.598	.000	-8.590	-2.521
	SES2	-5.068	2.257	-.112	-2.246	.025	-9.504	-.632
	YRSCH_IN	-1.072	1.164	-.172	-.921	.357	-3.359	1.215
	LOR_YR_T	-.922	.828	-.136	-1.114	.266	-2.549	.705
	AOA_YR	-1.585	.842	-.261	-1.883	.060	-3.239	.069
	GENDER_D	2.920	1.397	.093	2.091	.037	.175	5.665
	YD_IN	-2.873	.705	-.242	-4.076	.000	-4.259	-1.488
	GCOMP_N	.973	1.036	.156	.939	.348	-1.063	3.008

a Dependent Variable: NCREAD11 (Students' ITBS/TAP 11th grade NCE scores in Total Reading)

Table E-18

Backward Selection Regression Analyses: Summary of Independent Variables Found Significant

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-1.991	29.657		-.067	.947	-60.776	56.794
	NCRCOM8	.680	.082	.603	8.318	.000	.518	.842
	SES1	-2.216	2.485	-.068	-.892	.375	-7.141	2.710
	SES2	-8.998	3.837	-.174	-2.345	.021	-16.604	-1.392
	YRSCH_IN	-.987	2.430	-.118	-.406	.685	-5.803	3.829
	LOR_YR_T	.309	1.723	.035	.179	.858	-3.105	3.724
	AOA_YR	.701	1.728	.080	.406	.686	-2.724	4.126
	GENDER_D	.647	2.298	.020	.281	.779	-3.909	5.202
	YD_IN	-1.393	1.333	-.083	-1.046	.298	-4.035	1.248
	GCOMP_N	2.556	2.267	.304	1.127	.262	-1.938	7.049
	Models 2-5 not shown							
6	(Constant)	4.433	4.154		1.067	.288	-3.798	12.663
	NCRCOM8	.697	.077	.618	9.058	.000	.545	.850
	SES2	-7.693	3.539	-.149	-2.174	.032	-14.704	-.682
	YD_IN	-1.034	1.174	-.062	-.880	.381	-3.361	1.293
	GCOMP_N	1.926	.589	.229	3.272	.001	.760	3.092
7	(Constant)	3.025	3.830		.790	.431	-4.563	10.612
	NCRCOM8	.701	.077	.622	9.125	.000	.549	.853
	SES2	-8.009	3.517	-.155	-2.277	.025	-14.976	-1.042
	GCOMP_N	2.040	.573	.242	3.559	.001	.904	3.176

a Dependent Variable: NCREAD11 (Students' ITBS/TAP 11th grade NCE scores in Total Reading)

Table E-19
1989-1991 ITBS/TAP Reading Mean NCE Scores of Hispanics: Cross-sectional analyses

Year	Grade 4	Grade 8	Grade 11
1989	49 (N = 117)	49 (N = 93)	41 (N = 102)
1990	51 (N = 127)	47 (N = 130)	41 (N = 113)
1991	46 (N = 160)	47 (N = 138)	45 (N = 106)

Table E-20
1999-2001 Stanford 9 Reading Mean NCE Scores of Hispanics: Cross-sectional analyses

Year	Grade 4	Grade 6	Grade 9
1999	44 (N = 178)	52 (N = 238)	45 (N = 255)
2000	46 (N = 172)	52 (N = 226)	44 (N = 315)
2001	48 (N = 213)	49 (N = 226)	45 (N = 248)

Table E-21
1989-1991 ITBS/TAP Mathematics Mean NCE Scores of Hispanics: Cross-sectional analyses

Year	Grade 4	Grade 8	Grade 11
1989	55 (N = 117)	55 (N = 93)	43 (N = 102)
1990	54 (N = 127)	52 (N = 130)	43 (N = 113)
1991	53 (N = 160)	50 (N = 138)	45 (N = 106)

Table E-22
1999-2001 Stanford 9 Mathematics Mean NCE Scores of Hispanics: Cross-sectional analyses

Year	Grade 4	Grade 6	Grade 9
1999	52 (N = 178)	55 (N = 238)	47 (N = 255)
2000	55 (N = 172)	58 (N = 226)	46 (N = 315)
2001	55 (N = 213)	57 (N = 226)	48 (N = 248)

Overall Conclusions and Major Policy Implications

SUMMARY OF FINDINGS ACROSS ALL RESEARCH SITES

Each of the research contexts of this study illustrate varying aspects of the major factors that appear to influence the academic success of language minority students who begin their U.S. schooling with no proficiency in English. Overall, the five school districts examined have attempted to address the dimensions of the Prism Model of Language Acquisition for School (Thomas & Collier in Ovando & Collier, 1998, p. 89), as they continue to improve programs for their English language learners. The Prism Model focuses on four developmental processes that school-age students experience through Grades K-12–sociocultural, linguistic, cognitive, and academic processes. These processes develop subconsciously, occur simultaneously, and are interdependent. The findings of this research study demonstrate that it is crucial that educators provide a socioculturally supportive school environment for language minority students that allows natural language, academic, and cognitive development to flourish in both L1 and L2, comparable to the sociocultural support for ongoing language, academic, and cognitive development that native-English speakers are provided in school.

The qualitative findings from each research site illustrate that each school context is different, and significant elements within each educational context can have strong influence on students' academic achievement in the long term. Overall, we have found that the following major factors influence the success of programs for English language learners:

- **The potential quality of the type of program for ELLs.** This refers to the power of a particular program's features to influence student achievement. Some school programs for

ELLs are "feature-rich," with enhanced potential to affect student achievement, while others are "feature-poor," with little or no theoretical reason to believe that their use will help ELLs to close the achievement gap.

- **The realized quality of the type of program for ELLs.** This is the degree of full and effective implementation of a program in terms of administrative support; teacher skills and training to deliver the full instructional effect of the program; and the degree to which program installation, processes, and outcomes are monitored and formatively evaluated.

- **The breadth of program focus.** This refers to an instructional focus on the Prism Model dimensions of linguistic, cognitive, and academic development to native-speaker levels of English, as well as in students' primary language, in a supportive sociocultural school environment, as contrasted with a narrow and restrictive instructional focus, such as "just learning enough English to get by."

- **The quality of the school's instructional environment.** This refers to the degree to which the school becomes an additive language-learning environment rather than a subtractive environment, including parental engagement and support of the instructional program. In an additive bilingual environment, students acquire their second language without any loss of their primary language. Students who continue to develop cognitively in their primary language and develop age-appropriate proficiency in both first and second language can outscore monolinguals on school tests (Baker & Prys Jones, 1998).

- **The quality of available instructional time.** This is the degree to which instructional time is used effectively so that students receive maximally comprehensible instruction for an instructionally optimum time period, in classrooms where English language learners are not isolated, but where all students interact together and where instruction is driven by students' cognitive, academic, and linguistic developmental needs.

Overall, programs for English language learners that "score high" in these five major factors are long-term and enriched forms of bilingual/ESL instruction that provide for most or all of the documented achievement gap to be closed in the long term. Programs that "score low" on these major factors are remedial, short-term, and ineffective.

SUMMARY OF QUANTITATIVE ANALYSES

Major findings from the quantitative analyses that are statistically and practically significant for decision-making are presented below. For decision-making purposes, a 4 NCE difference between groups is considered a small but significant difference (equivalent to 0.2 of a national standard deviation [s.d.]), 5 NCEs an actionable significant difference (0.25 of a national s.d.), 6 NCEs a moderate significant difference (0.3 of a national s.d.), and 10 NCEs a very large significant difference (0.5 of a national s.d.).

ENGLISH ACHIEVEMENT FINDINGS

Focusing first on **program comparisons**, we summarize **English language learners' long-term achievement** on nationally standardized tests (ITBS, CTBS, Stanford 9, Terra Nova) **in English Total Reading** (the subtest measuring academic problem-solving across the curriculum–math, science, social studies, literature), for students who entered the U.S. school district with little or no proficiency in English in Grades K-1, and following them to the highest grade level reached by the program to date:

- English language learners immersed in the English mainstream because their parents refused bilingual/ESL services showed large decreases in reading and math achievement by Grade 5, equivalent to almost 3/4 of a standard deviation (15 NCEs), when compared to students who received bilingual/ESL services. The largest number of dropouts came from this group, and those remaining finished 11th grade at the 25th NCE (12th percentile) on the standardized reading test. (pp. 113-114, 122-124, Figures C-1, C-2, Tables C-1, C-2, C-10, C-11)

- When ESL content classes were provided for 2-3 years and followed by immersion in the English mainstream, ELL graduates ranged from the 31st to the 40th NCE with a median of the 34th NCE (23rd percentile) by the end of their high school years. (pp. 112-114, 126-127, 241-256, Figures C-1, C-2, E-1, E-6, E-7, E-8, E-9, E-14, Tables C-1, C-2, E-1, E-6, E-7, E-8, E-9, E-14)

- 50-50 Transitional bilingual education students who were former ELLs, provided with 50 percent instruction in English and 50 percent instruction in Spanish for 3-4 years, followed by immersion in the English mainstream, reached the 47th NCE (45th percentile) by the end of 11th grade. (pp. 112-114, 126-127, Figures C-1, C-2, Tables C-1, C-2)

- 90-10 Transitional bilingual education students who were former ELLs reached the 40th NCE (32nd percentile) by the end of 5th grade. (In 90-10 TBE, for Grades PK-2, 90 percent of instruction is in the minority language, gradually increasing English instruction until by Grade 5, all instruction is in the English mainstream for the remainder of schooling.) (pp. 119-122, Figure C-8, Table C-7)

- 50-50 One-way developmental bilingual education students who were former ELLs reached the 62nd NCE (72nd percentile) after 4 years of bilingual schooling in two high-achieving school districts, outperforming their comparison ELL group schooled all in English by 15 NCEs (almost 3/4 of a national standard deviation–a very large significant difference). By 7th grade, these bilingually schooled former ELLs were still above grade level at the 56th NCE (61st percentile). (A one-way program is one language group being schooled through two languages.) (pp. 48-52, 58, Figures A-1, A-3, Tables A-5, A-6)

- 90-10 One-way developmental bilingual education students who were former ELLs reached the 41st NCE (34th percentile) by the end of 5th grade. (90-10 means that for Grades PK-2, 90 percent of instruction is in the minority language, gradually increasing English instruction to 50 percent by Grade 5, and a DBE program continues both languages in secondary school.) (pp. 119-122, Figure C-8, Table C-7)

- 50-50 Two-way bilingual immersion students who were former ELLs attending a high-poverty, high-mobility school: 58 percent met or exceeded Oregon state standards in English reading by the end of 3rd and 5th grades. (Two-way is two language groups receiving integrated schooling through their two languages; 50-50 is 50 percent instruction in English and 50 percent in the minority language.) (pp. 201-204, Figures D-4, D-6, Table D-18)

- 90-10 Two-way bilingual immersion students who were former ELLs performed above grade level in English in Grades 1-5, completing 5th grade at the 51st NCE (51st percentile), significantly outperforming their comparison groups in 90-10 transitional bilingual education and 90-10 developmental bilingual education. (pp. 119-121, Figure C-8, Table C-7)

SPANISH ACHIEVEMENT FINDINGS

A goal of one-way and two-way bilingual education is to graduate students who are fully academically proficient in both languages of instruction, to prepare these students for the workplace of the 21st century. We summarize **native-Spanish-speakers' long-term achievement** on nationally standardized tests (Aprenda 2, SABE) **in Spanish Total Reading** (the subtest measuring academic problem-solving across the curriculum–math, science, social studies, literature), following them to the highest grade level reached by the program to date:

- In 50-50 Two-way bilingual immersion, Spanish-speaking immigrants after 1-2 years of U.S. schooling achieved at a median of the 62nd NCE (71st percentile) in Grades 3-6. These immigrants arrived on or above grade level and maintained above grade level performance in Spanish in the succeeding two years. (pp. 199-200, Figure D-2, Tables D-5, D-6)

- In 90-10 Transitional bilingual education classes, native-Spanish speakers reached the 56th to 60th NCE (61st to 68th percentile) for Grades 1-4, and after moving into all-English instruction in Grade 5, they tested at the 51st NCE, still on grade level in Spanish reading achievement. (pp.117-119, Figure C-5, Table C-4)

- In 90-10 Developmental bilingual education classes, native-Spanish speakers reached the 56th to 63rd NCE (61st to 73rd percentile) for Grades 1-4, and in Grade 5 they outperformed the TBE comparison group by 4 NCEs at the 55th NCE (60th percentile). (pp. 117-119, Figure C-5, Table C-4)

- In 90-10 Two-way bilingual immersion classes, native-Spanish speakers reached the 58th to 65th NCE (64th to 76th percentile) for Grades 1-4, and in Grade 5 they outperformed the TBE and DBE comparison groups by a significant 6 NCEs at the 61st NCE (70th percentile). (pp. 117-119, Figure C-5, Table C-4)

- In reading achievement across the curriculum, native-Spanish speakers outperformed native-English speakers when tested in their native language, for Grades 1-8, regardless of the type of bilingual program Spanish-speaking students received. Native-Spanish speakers remained significantly above grade level at every grade except sixth grade (at the 49th NCE), reaching the 64th NCE (74th percentile) in 8th grade. (pp. 117-119, Figure C-3, Table C-3)

ACHIEVEMENT FINDINGS IN OTHER SUBJECTS

- We chose the reading subtest of the standardized tests (results presented above) as the "ultimate" measure of attainment, because LM students' reading scores were consistently the lowest among the subjects, and this is the measure that most closely correlates with the standardized tests required for admission to post-secondary education. Generally, LM students achieved 5-10 NCEs higher in English language arts, math, science, social studies, and writing. (pp. 46-53, 111-114, 119-122, 241-256, Figures A-4, A-5, C-9, C-10, E-1 to E-14 and accompanying tables)

- In Spanish math, native-Spanish speakers generally outperformed native-English speakers tested in English math. When comparing native-Spanish speakers' achievement in Spanish math by program, for Grades 2-5, students attending all three bilingual program types achieved at or above the 55th NCE (60th percentile). But the Spanish speakers attending 90-10 Two-way bilingual immersion classes outperformed the Spanish speakers in 90-10 TBE and 90-10 DBE classes by 3-6 NCEs on Spanish math achievement, reaching the 59th NCE (66th percentile) by 5th grade. (pp. 114, 117-118, Figures C-4, C-6, Tables C-3, C-4)

ACHIEVEMENT OF NATIVE-ENGLISH SPEAKERS IN TWO-WAY BILINGUAL EDUCATION

- Native-English speakers in two-way bilingual immersion programs maintained their English, added a second language to their knowledge base, and achieved well above the 50th percentile in all subject areas on norm-referenced tests in English. These bilingually schooled students equaled or outperformed their comparison groups being schooled monolingually, on all measures. (pp. 46-53, 119, 124, 201-204, Figures A-3 to A-5, D-1, D-3, D-5, D-7, D-9, Tables A-1 to A-11, C-4, C-12, C-13, D-1 to D-4, D-7, D-8, D-10, D-12, D-13, D-15, D-17 to D-10)

INFLUENCE OF STUDENT BACKGROUND ON STUDENT ACHIEVEMENT

- Socioeconomic status (SES) typically influenced from 3-6% of LM students' reading achievement as measured by standardized tests, for both enrichment dual language programs and ESL content programs. In selected circumstances (e.g., oral proficiency of Spanish speakers learning English) the effect of SES explains as much as 11-12% of achievement. However, the effect of number of years of program participation on reading achievement varied with the program type. For one-way and two-way dual language programs, up to five years of program participation accounted for 6-9% of ELLs' reading achievement on standardized tests. For Spanish speakers learning English, 20% of oral proficiency was attributable to program exposure while program exposure accounted for 15% of oral proficiency for English speakers learning Spanish. In the case of the ESL Content program, years of schooling accounted for less than 2% of end-of-school reading achievement as measured by standardized tests. Thus, a strong dual language program can "reverse" the negative effects of SES more than a well-implemented ESL Content program by raising reading achievement to a greater degree. (pp. 56-57, 204-206, 256-258, Tables A-18, D-20, E-16 to E-18)

- The One-way developmental bilingual education program in Northern Maine influenced 8.5% of former ELLs' eventual reading achievement, exceeding the effects of low socioeconomic status at less than 4%. The Two-way bilingual immersion program at Grant Community School exerted a powerful and significant effect on Spanish-speaking students' scores on oral English development and influenced about 6 percent of their standardized reading scores as assessed in English, while SES accounted for about 4%. In this high-poverty school, SES alone accounted for 14 percent of the observed achievement variance overall. Thus, the school's dual language program is reducing the negative effects of SES by significant amounts for Spanish speakers learning English and taking the statewide assessment in English. (pp. 56-57, 204-206, 256-258, Tables A-18, D-20, E-16 to E-18)

- Number of years of primary language schooling, either in home country or in host country, had more influence than socioeconomic status when the number of years of schooling was 4 or more years. In addition, the L2 academic achievement of older immigrant arrivals with strong grade-level schooling completed in L1 in the home country was less influenced by low socioeconomic status and more dependent on number of years completed. Likewise, students of low socioeconomic status who were born in the U.S. or arrived at a very young age achieved at high levels in L2 when grade-level schooling was provided in both L1 and L2 in the U.S. (pp. 257-258, Figures C-1, E-6, E-7, Tables C-1, E-6, E-7, E-17, E-18)

- When immigrants were schooled all in English in the U.S., students who received 4-5 years of L1 schooling in home country (arriving at ages 10-12) scored 6 NCEs higher in English reading in 11th grade than those who received 1-3 years of home country schooling (arriving at ages 7-9). (pp. 248-251, Figures E-6, E-7, Tables E-6, E-7)

- Immigrants with interrupted schooling in home country achieved significantly below grade level, when provided instruction only in English. Those one year below grade level on arrival were at the 29th NCE (16th percentile) on the English reading test by 11th grade, those two years below grade level on arrival at the 26th NCE (13th percentile), those three years behind at the 20th NCE (8th percentile), and those four years behind at the 19th NCE (7th percentile). (pp. 251-253, Figure E-8, Table E-8)

- Gender differences among Hispanic students were found to be significant in only two subject areas–math and science. Hispanic males outperformed Hispanic females by 4 NCEs in math and 6 NCEs in science on the 11th grade tests in English. (p. 256, Figure E-14, Table E-14)

MAJOR POLICY IMPLICATIONS

- Enrichment 90-10 and 50-50 one-way and two-way developmental bilingual education (DBE) programs (or dual language, bilingual immersion) are the only programs we have found to date that assist students to fully reach the 50th percentile in both L1 and L2 in all subjects and to maintain that level of high achievement, or reach even higher levels through the end of schooling. The fewest dropouts come from these programs.

- Parents who refuse bilingual/ESL services for their children should be informed that their children's long-term academic achievement will probably be much lower as a result, and they should be strongly counseled against refusing bilingual/ESL services when their child is eligible. The research findings of this study indicate that ESL or bilingual services, as required by *Lau v. Nichols*, raise students' achievement levels by significant amounts.

- When English language learners (ELLs) initially attend segregated, remedial programs, these students do not close the achievement gap after reclassification and placement in the English mainstream. Instead, they maintain or widen the gap in later years. Therefore, their average achievement NCE at reclassification should be as high as possible, since this is likely to be their highest achievement level that they reach during their school years. Ideally, instructional gains are best accomplished in an enrichment (not a remedial) program.

- Students with no proficiency in English must NOT be placed in short-term programs of only 1-3 years. In this study and all other research studies following ELLs long term, the minimum length of time it takes to reach grade-level performance in second language (L2) is 4 years. Furthermore, only ELLs with at least 4 years of primary language schooling reach grade-level performance in L2 in 4 years. As a group, students with no primary language schooling (either in home country or host country) are not able to reach grade-level performance in L2.

- The strongest predictor of L2 student achievement is amount of formal L1 schooling. The more L1 grade-level schooling, the higher L2 achievement.

- Bilingually schooled students outperform comparable monolingually schooled students in academic achievement in all subjects, after 4-7 years of dual language schooling.

- Students who receive at least 4-5 years of grade-level L1 schooling in home country before they emigrate to the U.S. typically reach the 34th NCE (23rd percentile) by 11th grade when schooled all in English in the U.S. in an ESL Content program, and then the mainstream. These students are on grade level when they arrive, but it takes them several years to acquire enough English to do grade-level work, which is equivalent to interrupting their schooling for 1 or 2 years. Then they have to make more gains than the average native-English speaker makes every year for several years in a row to eventually catch up to grade level, a very difficult task to accomplish within the remaining years of K-12 schooling.

- The highest quality ESL Content programs close about half of the total achievement gap.

- When ELLs initially exit into the English mainstream, those schooled all in English outperform those schooled bilingually when tested in English. But the bilingually schooled students reach the same levels of achievement as those schooled all in English by the middle school years, and during the high school years the bilingually schooled students outperform the monolingually schooled students (see Figure C-2).

- Students who receive at least 5-6 years of dual language schooling in the U.S. reach the 50th NCE/percentile in L2 by 5th or 6th grade and maintain that level of performance, because they have not lost any years of schooling. Students raised in a dual language environment need at least 4 years of schooling in L1 and 4 years of schooling in L2 to achieve on grade level in either of the two languages. Providing bilingual schooling in the U.S. meets both needs simultaneously, typically in 4-7 years, leading to high academic achievement in the long term.

- Bilingual/ESL Content programs must be effective (at least 3-4 NCE gains per year more than mainstream students are gaining per year), well implemented, not segregated, and sustained long enough (5-6 years) for the typical 25 NCE achievement gap between ELLs and native-English speakers to be closed. Even the most effective programs can only close half of the achievement gap in 2-3 years, the typical length of remedial ELL programs. Therefore, short-term, remedial, and ineffective programs cannot close the large achievement gap and should be avoided.

- An enrichment bilingual/ESL program must meet students' developmental needs: linguistic (L1-L2), academic, cognitive, emotional, social, physical. Schools need to create a natural learning environment in school, with lots of natural, rich oral and written language used by students and teachers (L1 and L2 used in separate instructional contexts, not using translation); meaningful, 'real world' problem-solving; all students working together; media-rich learning (video, computers, print); challenging thematic units that get and hold students' interest; and using students' bilingual-bicultural knowledge to bridge to new knowledge across the curriculum.

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Appendix A

Sample Data Structure for Thomas-Collier Research Replication

Stage 1 Variables -- Needs Assessment

(The Thomas-Collier Test of Long-term Achievement Parity)

Field	*Field Name*	*Type*	*Width*	*Field Description*
1	IDNO	Numeric	10	Student ID number
2	ORI_ST_CLA	Character	3	Original student classification: LEP=LEP, LM-not LEP=LMN, native-English speaker=NES
3	DATENT_SCH	Character	6	Date student entered school (YYMMDD) ex: Jan 18 1980 = 800118
4	YRS_INT_SC	Numeric	6	No. years of interrupted schooling (if any)
5	DATETEST11	Character	6	Administration date of Grade 11 test (YYMMDD)
6	READNCE11	Numeric	2	Reading NCE for grade 11
7	READSCA11	Numeric	3	Reading Scale score for grade 11
8	MATHNCE11	Numeric	2	Math NCE for grade 11
9	MATHSCA11	Numeric	3	Math Scale score for grade 11

Stage 2 Variables -- Focus on LEP/ELL Achievement Trends

Field	*Field Name*	*Type*	*Width*	*Field Description*
10	DOB	Character	6	Student date of birth (YYMMDD)
11	PROG_TYPE1	Character	2	First program type (2D= 2-way DBE, 1D= 1-way DBE, TC= TBE Current, TT=TBE Traditional, EC= ESL Content, EP= ESL Pullout)
12	DATENT_PR1	Character	6	Date student entered first program
14	AOA	Character	4	Age on Arrival (computed variable) = DOB minus DATENT_SC (in months)
15	LOR	Character	4	Length of Residence (computed variable) = DATETEST11 minus DATENT_PR1 (in months)

Stage 3 and 4 Variables -- Gap Closure and Program Effectiveness, Adding New Cohorts

Field	*Field Name*	*Type*	*Width*	*Field Description*
16	DATEXT_PR1	Character	6	Date student exited first program
17	PROG_TYPE2	Character	2	Second program type (if any)
18	DATENT_PR2	Character	6	Date student entered second program
19	DATEXT_PR2	Character	6	Date student exited second program
17	PROG_TYPE3	Character	2	Third program type (if any)
18	DATENT_PR3	Character	6	Date student entered third program
19	DATEXT_PR3	Character	6	Date student exited third program
20	DATETEST08	Character	6	Administration date of Grade 8 test (YYMMDD)
21	READNCE08	Numeric	2	Reading NCE for grade 8
22	READSCA08	Numeric	3	Reading Scale score for grade 8
23	MATHNCE08	Numeric	2	Math NCE for grade 8
24	MATHSCA08	Numeric	3	Math Scale score for grade 8
25	DATETEST06	Character	6	Administration date of Grade 6 test (YYMMDD)
26	READNCE06	Numeric	2	Reading NCE for grade 6
27	READSCA06	Numeric	3	Reading Scale score for grade 6
28	MATHNCE06	Numeric	2	Math NCE for grade 6
29	MATHSCA06	Numeric	3	Math Scale score for grade 6

Stage 5 Variables -- Between-Program Comparisons with Extraneous Variable Control

Field	*Field Name*	*Type*	*Width*	*Field Description*
30	IMMIGRANT	Character	1	Y (yes) or N (no)
31	INIT_GRADE	Character	2	Initial student grade placement in school
32	LUNCH	Character	1	F (free), R(reduced), N (no lunch assistance)
33	OTHERCNTR1	Character	3	Other control variable #1
34	OTHERCNTR2	Character	3	Other control variable #2
35	OTHERCNTR3	Character	3	Other control variable #3

Appendix B

Thomas-Collier Collaborative Research with School Districts: Student Program Participation Data Collection Form for Research Stages 3-5

Wayne P. Thomas and Virginia P. Collier, George Mason University

Research funded by the Center for Research in Education, Diversity, & Excellence, U.S. Department of Education, Institute of Education Sciences (IES) (formerly the Office of Educational Research and Improvement (OERI)) from 1996-2001

The purpose of this data collection form is to capture program participation information in your school district. Pages 1-6 of this document explain the data collection process. The forms for data collection follow and may be duplicated as needed.

The Thomas and Collier research with collaborating school districts proceeds through five stages over a period of several years. These stages are completely explained in our "Five Stages" document which we have previously shared with you. In each stage, we address different research questions of interest and local school districts can insert their own local questions in each stage as well. Each stage also has its own information requirements, in the form of different types and forms of data needed to address each stage's research questions.

A quick review of these stages follows in Table 1. For each stage of the sequential Thomas and Collier research model, Table 1 indicates the major intent of that stage, the primary research questions addressed in that stage, and the data required from school districts to address those research questions.

In Table 1, we use several acronyms to describe various categories of students who receive instructional services in each school district. These acronyms are based on the terms adopted by the federal government and may differ from those used in some states and districts.

Term	**Explanation**
LEP	The acronym 'LEP' refers to those students who have been classified by the local district as "limited English proficient" (English Language Learners) and who have participated in district instructional programs designed to meet their needs.
ELL	English Language Learners -- generally synonymous with LEP

LM	The acronym 'LM' refers to Language Minority students (those who speak a language other than English at home).
◆	'LM-but-not-LEP' refers to students who qualify as Language Minority but who have not been classified as LEP by the school district.
NES	The acronym 'NES' refers to students who are native speakers of English and who are not LEP (limited English proficient) and not LM (language minority).

Table 1
Overview of Five-Stage Thomas and Collier Research Model in Participating School Districts

Stage	Major Intent	Primary Research Questions	Data Needed
One	to document the district's past achievement outcomes for three mutually exclusive groups of students and to compare the five-year progress of the three groups. This is also known as the Thomas-Collier Test of Equal Educational Opportunity: (1) former LEPs (English learners) (2) students who are Language Minority (LM) but not LEP (did not participate in a local LEP program) (3) native English speakers who are not part of groups (1) or (2) above	After five years of appropriate instruction in the district, is there an achievement gap between former LEPs (English language learners) and native-English speakers? Has the achievement gap between former LEPs, LM-but-not-LEPs, and native-English speakers widened, narrowed, or remained the same for the past 5 years?	downloads of test scores and student classification information from prior years Specifically: (1) student ID (2) original student classification (3) date entered school (4) test scores from recent years
Two	to document the past and present achievement performance of LEP students (English Learners)	Do LEP students close the achievement gap with each passing year? Do older LEP students close the achievement gap differently from younger students?	Additional student information Specifically: (1) date of birth (2) days attended school each year

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Table 1 Continued

Stage	Major Intent	Primary Research Questions	Data Needed
Three	to determine the average annual long-term achievement gains of former LEP students who participated in various types of programs for LEP students	Which programs allow students to close the achievement gap over time and which do not? Do students in some programs close the achievement gap better or faster than in other programs? What is the average sustained gain per year for each program?	Student program participation data Specifically: (1) program type(s) student received each year
Four	to enhance external validity (generalizability) and robustness of conclusions from stages One through Three by adding longitudinal cohorts, using cross-validation strategies, and employing resampling strategies.	Are the observed between-group and between-program differences in student achievement trends stable and consistent across comparable but different longitudinal cohorts of students during the past 5-10 years?	Stage 1-3 data for additional student cohorts
Five	to determine the long-term achievement of LEP students who received selected LEP programs in the past with control of pertinent extraneous variables on the enhanced data sets from Stage Four	With selected extraneous variables controlled using sample selection, blocking, or ANCOVA (if appropriate), are there long-term differences in student achievement among programs?	Student characteristics and other variables to be controlled Specifically: (1) initial grade placement in school (2) free-reduced lunch for each year (3) initial test scores at beginning of schooling

Stage 1 of our collaborative research with your school district is a **needs assessment** that investigates how the three mutually exclusive groups have fared instructionally during the past five years in the school district's instructional programs.

Stage 2 then looks **only at LEP students and achievement gap closure**, by age and by date of entry into the school district. No program comparisons are attempted in Stages 1 and 2, but **program comparisons** are the major focus in Stages 3-5.

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Stage 3 Data Collection

We have been planning or engaged in data collection for Stages 1 and 2 in your district in the past. Data collection for stages 1 and 2 has primarily focused on student characteristics and test scores over the past 5-10 years, in order to allow us to address Stage 1 and Stage 2 research questions. **Since our research is long-term, requiring several years of data collection, we must collect and store data each school year on the program experiences that each student receives in order to address the Stage 3 questions that compare achievement trends and effect sizes for various program alternatives.** Using this annual 'program participation' data, we can link student program experiences to long-term achievement test data that is collected during, and at the end of, the project. A greatly simplified form of this process might appear as follows:

Year 1 -- Collect student participation data (type of program experiences received by each LEP student) for Year 1 programs
Year 2 -- Collect student participation data for Year 2 programs
Year 3 -- Collect student participation data for Year 3 programs
Year 4 -- Collect student participation and test score data for each student for Year 4
Year 5 -- Calculate average test scores for students who participated in each program type in Years 1-4

It is now time to begin collecting Stage 3 data, information on which program types were received by each LEP student, by the end of each school year in June. This information should be captured now (or soon), in each school. When approaching the end of the school year, it is important to collect this information before the district's centralized student information system is "reset"during the summer prior to the beginning of the new school year in September. For most school districts, a professional who regularly observes in classrooms (e.g., a resource teacher) can provide a reality-based brief description of the typical instructional experience that will suffice for initial Stage 3 work. With each passing year, however, we plan to collect "finer-grained" data on the exact nature of instructional strategies utilized with language minority students, probably through the use of a teacher survey and/or teacher interviews.

Our overall objective in Stage 3 is to be able to document the types of instructional experiences received by each LEP student during each school year. Operationally, this means that we must be able to link each LEP student ID number with a description of a program type that was employed in the student's school (for school-wide LEP programs) or in the student's class (for situations where different program types are employed within the same school) for each school year under study. For example:

Case #1: for schools in which the same LEP program and instructional strategies are used school-wide, a download of the school's student ID numbers of the school's LEP students can be mass-matched with a code describing the program type (e.g., ESL taught through content) that is in use throughout that school. However, if there are substantial variations in how a program type is implemented and delivered from one classroom to another, the nature of these variations should be documented. For example, the program type called "ESL taught through content" can be delivered with substantial variations in teacher instructional strategies. In this case, the label "ESL taught through content" should be supplemented with class-by-class descriptions of how this program has been delivered to English language learners by individual teachers.

Case #2: for schools in which different LEP program and instructional strategies are used in classrooms within a school, we will need to link a teacher name or number to each student ID. To each teacher name or number, we will need to link a brief description of the LEP instructional practices utilized by each teacher.

How should program types be described?

In prior research and writing, we have referred to three major categories of program types. These include **Enrichment Bilingual Programs, Remedial Bilingual Programs, and Remedial English-only Programs.** To these, we can add **Enhanced English-only Programs** such as the Cognitive Academic Language Learning Approach (CALLA). Program types within each of these major categories may vary their names or labels by state and by district. The commonly encountered program types that we include in each of the four major program categories are listed below.

Category 1: Remedial Bilingual Programs - includes Transitional Bilingual Education, both Early-Exit (generally 2-3 years in length) and Late-Exit (generally 3-5 years in length)

Category 2: Remedial English-only Programs - includes ESL Pullout and ESL taught through content in elementary schools, and Sheltered ESL instruction in high schools, taught as a remedial subject for 1-3 periods per day

Category 3: Enrichment Bilingual Programs - includes one-way developmental bilingual education, two-way developmental bilingual education. Other names are dual-language programs, dual-immersion programs, bilingual immersion programs. Focus is on grade-level academic work across the curriculum, taught through the two languages, using interactive, discovery, hands-on learning.

Category 4: Enhanced English-only Programs - ESL taught through content or Sheltered ESL instruction (see Category 2 above) that also provides additional emphasis on student cognitive development; grade-level academic work across the curriculum; interactive, discovery, hands-on learning, or other instructional improvements to "basic ESL." Often this is done in a self-contained classroom for 1-2 years, or occasionally an ESL teacher teams with a mainstream teacher (both as equal partners in the teaching).

While program labels such as "ESL Pullout" are frequently employed, we and other researchers have found that there can be substantial variation within program categories when programs are actually delivered in classrooms to English language learners. In our prior work, we have attempted to draw attention away from program labels and instead to emphasize the **features and characteristics of classroom instruction** under each program type.

From our analyses, it appears that we should be able to characterize at least five factors in order to achieve a fully-specified LEP program description. These factors are presented in the form of questions (and possible answers) below. While instruction in any classroom can include a highly complex set of teacher-student and student-student interactions, we have found that useful distinctions among LEP program types can be framed by describing the classroom instruction in terms of answers to the following questions:

Factor #1: Is the teacher fully bilingual and capable of teaching in both English and in another language (e.g., Spanish)? Is the teacher certified in bilingual instruction? In ESL instruction? As a mainstream teacher?

Factor #2: Does the teacher teach English as a subject only; or does the teacher teach some subjects (e.g. math, language arts); or does the teacher teach all subjects (math, science, social studies, language arts)?

Factor #3: Does the student's teacher use the student's first language (other than English) in instruction? If so, approximately how much of the student's instructional time is in the student's first language?

If yes, the program is bilingual (TBE, one or two-way DBE)
If no, the program is English-only (ESL pullout, ESL taught through content, sheltered English instruction)

Factor #4: Does the teacher use cooperative learning strategies, both whole language and phonics-based reading instruction, variably-sized small-group instruction, non-textbook-based instructional materials, or other "current" instructional strategies? Or does the teacher use "traditional" homogeneous instructional strategies that rely primary on text-driven instruction in large groups? Does the teacher explicitly teach problem-solving skills in order to improve student cognitive development?

Factor #5: Are mainstream native-English speakers present in the LEP classroom (e.g., two-way DBE) or not?

As you work with this data collection form, you may add other variables and information that you consider important to collect, to help us define meaningful distinctions in program variations. We encourage your suggestions for improvement of the quality of data collected.

Thomas-Collier Collaborative Research with School Districts: Student Program Participation Data Collection Form

Dear Educator: both Dr. Thomas and Dr. Collier are working with your school district's staff to collect information about the classroom experiences of your students this year. Our purpose is to help your school district to find the most effective instructional practices for your limited English proficient (LEP) or English language learner (ELL) students and your native-English speakers by linking student classroom experiences to long-term student achievement. We appreciate your assistance in gathering data for this research purpose.

School/Class Information

School Year: ________ Name of School: ______________________

School Number: ________ (if used)

School and Class Characteristics	**For each statement, please answer Yes(Y) or No(N)**
We have only one type of program for ELLs/LEPs in our school.	
We have ESL Pullout classes for ELLs/LEPs in our school.	
We have ESL Content classes for ELLs/LEPs in our school.	
We have Sheltered ESL classes for ELLs/LEPs in our school.	
We have ESL Self-contained classes for ELLs/LEPs in our school.	
We have early-exit Transitional Bilingual classes for ELLs/LEPs in our school.	
We have late-exit Transitional Bilingual classes for ELLs/LEPs in our school.	
We have One-way Developmental Bilingual classes for ELLs/LEPs in our school.	
We have Two-way Developmental Bilingual classes for ELLs/LEPs in our school.	
All students in our school attend Developmental Bilingual classes.	
Other important school characteristics? (please list) ______________________	

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IMPORTANT CONTEXTUAL INFORMATION ABOUT YOUR SCHOOL OR STUDENTS

that we should consider in our joint research with your school district:

Teacher Information

Teacher Name: ____________________ Teacher Number: (if used) _______________

Teacher/Classroom Characteristics	**(circle all responses below that apply)**
What grade level(s) are taught by this teacher?	1 2 3 4 5 6 7 8 9 10 11 12
What is the typical class size in your classes?	______ students **(please write in class size)**
What is the typical number of ELLs/LEPs in your classes?	______ students **(please write in number of ELLs/LEPs)**
	Please answer Yes (Y) or No (N) below
Does this teacher team-teach with another teacher? If yes, name of other teacher? ____________________________ ____________________________	
Is there a teacher aide provided in your classes?	
Other important teacher/classroom characteristic? (please list)______________________ ______________________	

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Teacher Credentials	**Please answer Yes(Y) or No(N)**
Teacher is certified to teach in mainstream classes.	
Teacher is certified to teach bilingual classes.	
Teacher is certified for ESL classes.	
Teacher can teach only in English.	
Teacher can teach only in another language. (which language?) ______________________	
Teacher can teach in English and another language.	
Teacher is strongly proficient in both English and another language.	
Teacher is teaching using both languages in instruction this year.	

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ADDITIONAL INFORMATION ABOUT TEACHER CREDENTIALS

that should be considered:

Instructional Use of Students' First Language (L1) and English	**Please answer Yes (Y) or No (N) or Not Applicable(NA)**
Teacher teaches ESL as an English class (English as a subject).	
Teacher teaches ESL through one or two subjects (e.g., math, science).	
Teacher teaches ESL through all subjects (self contained ESL class).	
Teacher teaches some subjects through ESL and some through students' L1.	
In one school week, 100% of instructional time is in English.	
In one school week, at least 10% of instructional time is in students' L1.	
In one school week, at least 20% of instructional time is in students' L1.	
In one school week, at least 30% of instructional time is in students' L1.	
In one school week, at least 40% of instructional time is in students' L1.	
In one school week, at least 50% of instructional time is in students' L1.	
In one school week, at least 60% of instructional time is in students' L1.	
In one school week, at least 70% of instructional time is in students' L1.	
In one school week, at least 80% of instructional time is in students' L1.	
In one school week, at least 90% of instructional time is in students' L1.	

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Instructional Use of Students' First Language (L1) and English	**Please answer Yes (Y) or No (N) or Not Applicable(NA)**
In a bilingual class, the teacher separates the use of the two languages and does not translate.	
In a bilingual class, the students are allowed to use both languages as needed.	
Other (please write in and answer Yes or No): ____________________	

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Teacher's Commonly-used Instructional Strategies	**Please tell us how often each strategy is used by answering: "Frequently" (F) or "Sometimes" (S) or "Not at all" (N)**
Teacher uses cooperative learning.	
Teacher uses microcomputers in instruction.	
Teacher uses whole language (with phonics included).	
Teachers uses hands-on instructional materials.	
Teacher uses discovery learning.	
Teacher uses critical pedagogy for older students.	
Teacher uses text-driven instruction.	
Teacher uses authentic assessment.	
Teachers teaches learning strategies.	
Teacher teaches process writing.	
Teacher uses multicultural literature.	
Teachers uses pairs and small-group learning.	
Teacher uses phonics-based basal texts for initial literacy.	
Teacher uses thematic lessons.	
Teacher stimulates cognitive development through students' multiple intelligences.	
Teacher connects curriculum to students' experiences.	
Teacher uses the community and parents' knowledge regularly as a resource for student learning.	
Teacher uses visuals, manipulatives, posters, timelines, maps, etc.	

Teacher integrates art, music, drama into the curriculum.	
Teacher uses journal writing.	
Teacher incorporates bicultural knowledge into the curriculum.	
Teacher mostly lectures (at secondary level).	
Other: (please write in and answer Yes or No) ____________________	

Types of Interactions between LEP students and native-English speakers(NESs)	**Please answer Yes (Y) or No (N) or Not Applicable(NA)**
LEPs and NESs interact only at recess and lunch	
LEPs and NESs interact in mainstream classes taught in English	
If yes, for how many hours per day? **(estimate)** ______________	
LEPs and NESs interact at recess, lunch, and specials (e.g., physical education, art, music, computer lab)	
If yes, for how many hours per day? **(estimate)** ______________	
LEPs and NESs interact all day in all classes in two languages	

Both we and your school district thank you for your assistance! Please feel free to add any additional comments, questions, or suggestions in the space below. We would especially be interested in any questions (and your answer) that you believe that we should have asked, but didn't.

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The Dual Language Program Planner: A Guide for Designing and Implementing Dual Language Programs, by E. Howard, N. Olague, & D. Rogers, 2003

Directories

Directory of Secondary Newcomer Programs in The United States: Revised 2000, by D. J. Short & B. A. Boyson, 2000

Directory of Two-Way Bilingual Immersion Programs in the United States, by J. Sugarman & L. Howard, online at http://www.cal.org/twi/directory

National Directory of Teacher Preparation Programs (Preservice & Inservice) for Teachers of Linguistically and Culturally Diverse Students, online at http://www.colorado.edu/education/BUENO/crede/index.html

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